



March 8, 2007

Mr. Chuck Zimmerman Brown and Caldwell 3264 Goni Road, Suite 153 Carson City, NV 89706

Dear Mr. Zimmerman:

Enclosed is the quality assurance review of the analytical data for the analyses of five filter samples that were collected on December 1, 2006, in association with the ARCO Yerington Mine Site (Event 113). The samples were analyzed for gross alpha, radium-226, radium-228, thorium-230, and thorium-232.

Based on this quality assurance review, the gross alpha results, one radium-226 result, and two thorium-230 results were qualified as estimated because these positive results were reported between the method detection limit and the reporting limit.

If you have any questions or comments, please do not hesitate to call.

Sincerely,

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Concurred by:

Konstadina Vlahogiani, M.S. Senior Quality Assurance Chemist III/ Project Manager

KUlahogiani

Rock J. Vitale, CEAC, CPC Technical Director of Chemistry/ Principal

KV/RJV:hm Enc.

cc: Ms. Susie Kocsis – Brown and Caldwell

1140 Valley Forge Road P.O. Box 810 Valley Forge, PA 19482-0810 **Tel:** 610.935.5577 **Fax:** 610.935.5583 **Web**: www.envstd.com





# QUALITY ASSURANCE REVIEW OF THE FILTER SAMPLES COLLECTED AT THE ARCO YERINGTON MINE SITE ON DECEMBER 1, 2006 (EVENT 113)

March 8, 2007

Prepared for:

### ATLANTIC RICHFIELD COMPANY

28100 Torch Parkway Warrenville, IL 60555

Prepared by:

### **ENVIRONMENTAL STANDARDS, INC.**

1140 Valley Forge Road P.O. Box 810 Valley Forge, PA 19482-0810

Issued to:

BROWN AND CALDWELL 3264 Goni Road, Suite 153 Carson City, NV 89706

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### 1.0 Introduction

This quality assurance (QA) review is based upon a rigorous examination of all data generated from the analyses of five filter samples that were collected by Brown and Caldwell on December 1, 2006, in association with the ARCO Yerington Mine Site (Event 113). The samples included in this QA review are specified on Table 1.

This review has been performed with guidance from the "National Functional Guidelines for Inorganic Data Review" (US EPA, 2/94). This document is not entirely applicable to the type of analyses and analytical protocols performed on the samples evaluated in this QA review, but it has been used with professional judgment to aid the data reviewer in the interpretation of the QC analysis results and in the overall evaluation of the sample data deliverables. It should also be noted that results affected by blank contamination will be designated with a "UJ" qualifier (not the "U" qualifier typically used when following the National Functional Guidelines) in order to be consistent with historical project validation protocols and the current project database.

The reported analytical results are presented as a summary of the data in Section 2. Data were examined to determine the usability of the analytical results and the compliance relative to the requirements specified in the published analytical methods, the Severn Trent Laboratories, Inc. (STL) analytical Standard Operating Procedures (SOPs), the Quality Assurance Project Plan (QAPjP) for the Atlantic Richfield Company Yerington Mine Site (October 2006), and the Technical Requirements For Environmental Laboratory Analytical Services BP Global Contract Lab Network (GCLN) (5/22/02, Revision 08). Qualifier codes have been placed next to results to enable the data user to quickly assess the qualitative and/or quantitative reliability of any result. This critical QA review identifies data quality issues for specific samples and specific evaluation criteria. The data qualifications allow the data's end-user to best understand the usability of the analytical results. Data not qualified in this report should be considered valid based on the QC criteria that have been reviewed. Details of this QA review are presented in Section 1 of this report. This report was prepared to provide a critical review of the laboratory analyses and reported analytical results. Rigorous QA reviews of laboratory-generated data routinely identify various problems associated with analytical measurements, even from the most experienced and capable laboratories.

TABLE 1
SAMPLES INCLUDED IN THIS QUALITY ASSURANCE REVIEW

Field Sample Identification	Laboratory Sample Identification	Report Number	Matrix	Date Sample Collected	Parameters Examined
P-0812	J7A090287-1	34418	Filter	2/1/06	α, <sup>226</sup> Ra, <sup>228</sup> Ra, Th
P-0813	J7A090287-2	34418	Filter	2/1/06	α, <sup>226</sup> Ra, <sup>228</sup> Ra, Th
P-0814	J7A090287-3	34418	Filter	2/1/06	α, <sup>226</sup> Ra, <sup>228</sup> Ra, Th
P-0815 (Field Duplicate of P-0812)	J7A090287-4	34418	Filter	2/1/06	α, <sup>226</sup> Ra, <sup>228</sup> Ra, Th
000580	J7A090287-5	34418	Filter	2/1/06	α, <sup>226</sup> Ra, <sup>228</sup> Ra, Th

### NOTES:

 $\alpha$  - Gross Alpha by STL SOP RICH-RC-5014/5016 (based on US EPA Method 900.0). 
 Radium-226 by STL SOP RICH-RC-5005 (based on US EPA Method 903.1). 
 Radium-228 by STL SOP RICH-RC-5005 (based on US EPA Method 904.0). 
 Thorium-228, Thorium-230, and Thorium-232 by STL SOP RICH-RC-5087.

### 2.0 Findings

Complete support documentation for this radiological analysis QA review is presented in Section 8.0 of this report.

### A. Gross Alpha Analysis

Five samples were analyzed for gross alpha by STL SOP RICH-RC-5014/5016 (based on US EPA Method 900.0). The findings offered in this report for this fraction are based on the items on the following table.

Item Reviewed	Acceptable	Acceptable With Discussion	Acceptable With Qualification	Not Acceptable
Holding Times	√			
Blank Results	√			
LCS Recoveries	√			
Field Duplicate Precision	√			
Efficiency Checks	√			
Background Checks	$\checkmark$			
Sample Preparation	√			
Quantitation of Results			V	
Evaluation of Raw Data	√			

<u>Quantitation of Results:</u> All positive results reported at concentrations greater than the method detection limit (MDL) but less than the reporting limit (RL) were qualified as estimated and have been flagged "J" on the data tables.

### B. Radium-226 Analysis

Five samples were analyzed for radium-226 by STL SOP RICH-RC-5005 (based on US EPA Method 903.1). The findings offered in this report for this fraction are based on the items on the following table.

Item Reviewed	Acceptable	Acceptable With Discussion	Acceptable With Qualification	Not Acceptable
Holding Times	√			
Blank Results	$\checkmark$			
LCS Recoveries	√			
Chemical Yield	√			
Field Duplicate Precision	√			
Instrument Performance Checks	√			
Background Checks	√			

Item Reviewed	Acceptable	Acceptable With Discussion	Acceptable With Qualification	Not Acceptable
Sample Preparation	√			
Quantitation of Results			V	
Evaluation of Raw Data	√			

Quantitation of Results: All positive results reported at concentrations greater than the MDL but less than the RL were qualified as estimated and have been flagged "J" on the data tables.

### C. Radium-228 Analysis

Five samples were analyzed for radium-228 by STL SOP RICH-RC-5005 (based on US EPA Method 904.0). The findings offered in this report for this fraction are based on the items on the following table.

Item Reviewed	Acceptable	Acceptable With Discussion	Acceptable With Qualification	Not Acceptable
Holding Times	√			
Blank Results	$\checkmark$			
LCS Recoveries	√			
Chemical Yield	$\checkmark$			
Field Duplicate Precision	√			
Efficiency Checks	√			
Background Checks	√			
Sample Preparation	√			
Quantitation of Results	√			
Evaluation of Raw Data	√			

No findings were observed for the radium-228 fraction.

### D. Thorium-228, Thorium-230, and Thorium-232 Analysis

Five samples were analyzed for thorium-228, thorium-230, and thorium-232 by STL SOP RICH-RC-5087. The findings offered in this report for this fraction are based on the items on the following table.

Item Reviewed	Acceptable	Acceptable With Discussion	Acceptable With Qualification	Not Acceptable
Holding Times	V			
Blank Results	V			
LCS Recoveries				V

Item Reviewed	Acceptable	Acceptable With Discussion	Acceptable With Qualification	Not Acceptable
Chemical Yield	√			
Field Duplicate Precision	√			
Energy Calibration Check	√			
Efficiency Calibration Check	√			
Background Check	√			
Full Width at the Half Maximum	√			
Sample Preparation	√			
Quantitation of Results			V	
Evaluation of Raw Data	√			

<u>LCS Recoveries:</u> As noted in the Case Narrative, a tracer was inadvertently added to the LCS vial instead of a spike solution; therefore, no LCS in this batch of samples was analyzed for isotopic thorium. Data were not qualified due to this issue.

<u>Quantitation of Results:</u> All positive results reported at concentrations greater than the MDL but less than the RL were qualified as estimated and have been flagged "J" on the data tables.

### 3.0 Qualifier Summary Tables

### A. Gross Alpha Analysis

Analyte	Report Number	Samples	Validation Qualifier	Reason for Qualification
gross alpha	34418	All samples	J	positive result reported between the MDL and RL

### B. Radium-226 Analysis

Analyte	Report Number	Sample(s)	Validation Qualifier	Reason(s) for Qualification
radium-226	34418	000580	J	positive result reported between the MDL and RL

### C. Radium-228 Analysis

Analyte	Report Number	Sample(s)	Validation Qualifier	Reason(s) for Qualification
Qualification of Data Was Not Warranted				

### D. Thorium-228, Thorium-230, and Thorium-232 Analysis

Analyte	Report Number	Samples	Validation Qualifier	Reason for Qualification
thorium-230	34418	P-0812 and 000580	J	positive result reported between the MDL and RL

### 4.0 Overall Assessment

Based on this quality assurance review, the gross alpha results, one radium-226 result, and two thorium-230 results were qualified as estimated due to positive results reported between the MDL and the RL.

### 5.0 Radiological Data Qualifiers and Valid Reason Codes

### Radiological Data Qualifiers

- U Analyte not detected at the detection limit concentration.
- J Reported value is an estimated concentration.
- UJ Analyte not detected at an estimated detection limit concentration.
- R These data were rejected and were not used for any purposes.
- UR The analyte was not detected. The detection limit is unreliable and may be representative of a false negative. These data were rejected and are not usable for any purpose.

### Valid Reason Codes

- 1 Holding time violation
- 2 Method blank contamination
- 3 Surrogate recovery
- 4 Matrix spike/matrix spike duplicate recovery
- 5 Matrix spike/matrix spike duplicate precision outside limits
- 6 Laboratory control sample recovery
- 7 Field blank contamination
- 8 Field duplicate precision outside limits

- 9 Other deficiencies (including cooler temperature)
- A Absence of supporting QC
- S ICV, CCV or column performance check problem
- Y Initial and continuing calibration blank problem
- M Interference check samples problem
- O Post-digestion spike outside of 85-115%
- F MSA correlation coefficient <0.995, or MSA not done
- G Serial dilution problem
- K DFTPP or BFB tuning problem
- Q Initial calibration problem
- X Internal standard recovery problem
- V Second source standard calibration verification problem
- L Low bias
- Z Retention time problem
- N Counting time error (radionuclide chemistry)
- W Detector instability (radionuclide chemistry)
- C Co-elution of compounds
- E Value exceeds linear calibration range
- I Interferences present during analysis
- T Trace level compound, poor quantitation
- P 1C/2C precision outside of limits
- B LCS/LCSD precision outside limits
- D Lab Dup/Rep precision outside limits
- H High bias

### 6.0 Signatures

Report prepared by:

Konstadina Vlahogiani, M.S.

Senior Quality Assurance Chemist III/ Project Manager

Report reviewed and approved by:

Rock J. Vitale, CEAC, CPC Technical Director of Chemistry/

Principal

ENVIRONMENTAL STANDARDS, INC. 1140 Valley Forge Road P.O. Box 810

Valley Forge, PA 19482-0810

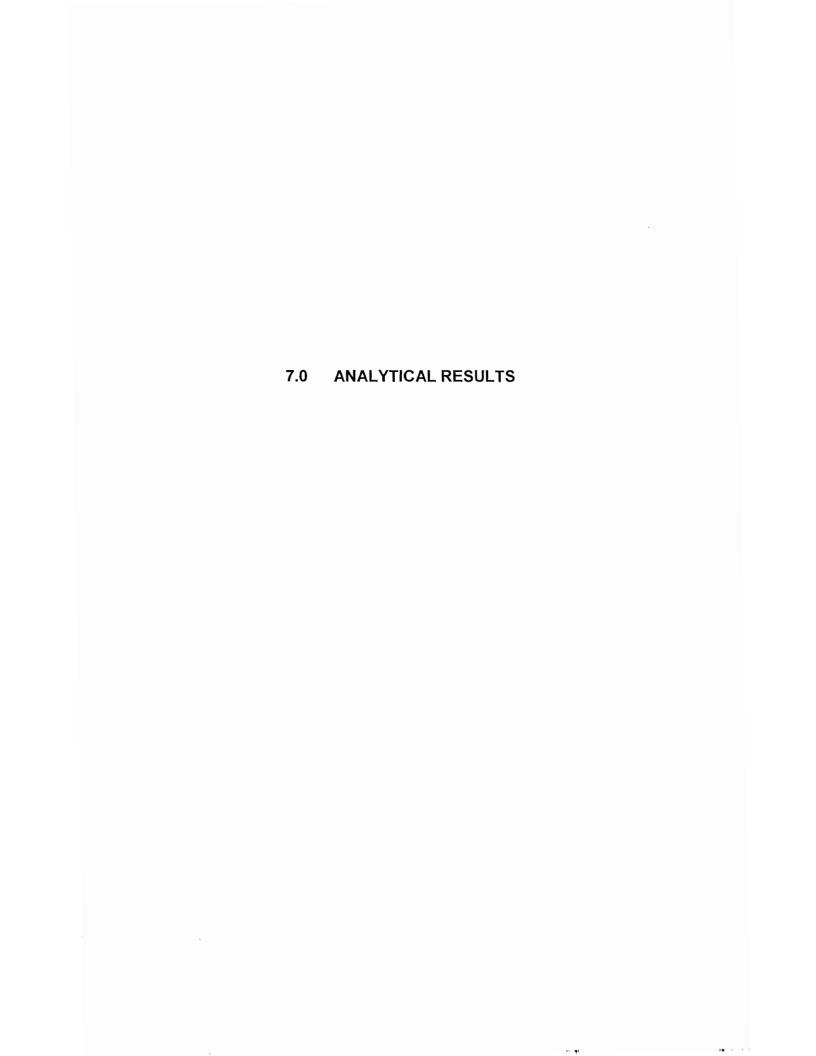
(610) 935-5577

Report reviewed by:

Donald J. Lancaster, M.S.

Senior Quality Assurance Chemist II

Date: 3/8/07



	Lab Sample	9JMK81	10				9JMK81	20				9JMLA1	10			
	Field Sample	P-0812					P-0812					P-0813				
	Collect Date	12/1/200	6				12/1/200	)6				12/1/200	06			
	Туре	N					N					И				
	Parent															
16	Units	Result	Qual /	MDL	RDL	Uncert	Result	Qual /	MDI	RDI	Uncert	Result	Qual /	MDI	BDI	Uncert

														l				
Method	CAS	Chemical Name	Units	Result	Qual /	MDL	RDL	Uncert	Result	Qual /	MDL	RDL	Uncert	Result	Qual /	MDL	RDL	Uncert
	Number				Reason					Reason					Reason			
E900.0	ALPHA	ALPHA, GROSS	PCI	7.36	J/T	5.37	20	4.3						5.02	J/T	3.81	20	3.2
E903.1	RA-226	RADIUM-226 .	PCI	-0.0186	U	0.804	1	0.42						0.269	U	0.745	1	0.43
E904.0	RA-228	RADIUM-228 ·	PCI						1.15	U	2.59	3.1	1.2	,		_		
ISOTH	TH-228	THORIUM-228.	PCI	0	U	0.425	1	0.17						0.0779	U	0.839	1	0.37
	TH-230	THORIUM-230•	PCI	0.303	J/T	0.227	1	0.22						0.224	U	0.448	1	0.27
	TH-232	THORIUM-232	PCI	-0.0378	U	0.278	1	0.093						0	U	0.448	1	0.17

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			Lab Sample	9JMLA1	20				9JMLA4	10				9JMLA4	20			
			Field Sample	P-0813					P-0814					P-0814				
			Collect Date	12/1/200	06				12/1/200	)6				12/1/200	06			
			Туре	N					N					N				
			Parent															
Method	CAS Number	Chemical Name	Units	Result	Qual / Reason	MDL	RDL	Uncert	Result	Qual / Reason	MDL	RDL	Uncert	Result	Qual / Reason	MDL	RDL	Uncert
E900.0	ALPHA	ALPHA, GROSS	PCI		-				10.2	J/T	5.17	20	4.9					
E903.1	RA-226	RADIUM-226	PCI						-0.201	U	0.655	1	0.3					
E904.0	RA-228	RADIUM-228	PCI	0.443	U	2.19	3.1	0.96						0.859	U	2.57	3.1	1.2
ISOTH	TH-228	THORIUM-228	PCI						0.186	U	0.446	1	0.26					
	TH-230	THORIUM-230	PCI						0.127	U	0.305	1	0.18					
	TH-232	THORIUM-232	PCI						-0.0254	U	0.305	1	0.11					

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			Lab Sample	9JMLA7	10				9JMLA7	20				9JMLA8	10			
			Field Sample	P-0815					P-0815					000580				
			Collect Date	12/1/200	)6				12/1/200	06				12/1/200	06			
			Туре	FD		_			FD					N				
			Parent	P-0812					P-0812									
Method	CAS	Chemical Name	Units	Result	Qual /	MDL	RDL	Uncert	Result	Qual /	MDL	RDL	Uncert	Result	Qual /	MDL	RDL	Uncert
	Number				Reason					Reason					Reason			
E900.0	ALPHA	ALPHA, GROSS	PCI	8.52	J/T	4.52	20	4.3						12.5	J/T	4.49	20	5.3
E903.1	RA-226	RADIUM-226	PCI	0.422	U	0.503	1	0.36			_			0.52	J/T	0.312	1	0.3
E904.0	RA-228	RADIUM-228	PCI						0.325	U	2.54	3.1	1.1		_			
ISOTH	TH-228	THORIUM-228	PCI	0.164	U	0.201	1	0.16						0.115	U	0.247	1	0.15
	TH-230	THORIUM-230	PCI	0.0954	U	0.163	1	0.12						0.365	J/T	0.195	1	0.24
	TH-232	THORIUM-232	PCI	0.0204	U	0.193	1	0.071						0.0276	U	0.165	1	0.07

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Lab Sample	9JMLA820
Field Sample	000580
Collect Date	12/1/2006
Туре	N
Parent	

Method	CAS Number	Chemical Name	Units	Result	Qual / Reason	MDL	RDL	Uncert
E900.0	ALPHA	ALPHA, GROSS	PCI					
E903.1	RA-226	RADIUM-226	PCI					_
E904.0	RA-228	RADIUM-228	PCI	0.902	U	2.3	3.1	1
ISOTH	TH-228	THORIUM-228	PCI					
	TH-230	THORIUM-230	PCI					
	TH-232	THORIUM-232	PCI					

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# 8.0 SUPPORTING DOCUMENTATION

### **Analytical Data Package Prepared For**

### **Brown and Caldwell**

Yerington Mine - Event #113

Radiochemical Analysis By

### **STL Richland**

2800 G.W. Way, Richland Wa, 99354, (509)-375-3131.

Assigned Laboratory Code: STLR

Data Package Contains \_\_\_\_\_ Pages

Report No.: 34418

SDG No.	Order No.	Client Sample ID (List Order	) Lot-Sa No.	Work Order	Report DB ID	Batch No.
33442	<b>EVENT 113</b>	000580	J7A090287-5	JMLA81AA	9JMLA810	7011219
		000580	J7A090287-5	JMLA81AE	9JMLA810	7011221
		000580	J7A090287-5	JMLA81AC	9JMLA810	7011225
		000580	J7A090287-5	JMLA82AD	9JMLA820	7029198
		P-0812 \	J7A090287-1	JMK811AA	9JMK8110	7011219
		P-0812	J7A090287-1	JMK811AE	9JMK8110	7011221
		P-0812	J7A090287-1	JMK811AC	9JMK8110	7011225
		P-0812 '	J7A090287-1	JMK812AD	9JMK8120	7029198
		P-0813	J7A090287-2	JMLA11AA	9JMLA110	7011219
		P-0813	J7A090287-2	JMLA11AE	9JMLA110	7011221
		P-0813	J7A090287-2	JMLA11AC	9JMLA110	7011225
		P-0813	J7A090287-2	JMLA12AD	9JMLA120	7029198
		P-0814	J7A090287-3	JMLA41AA	9JMLA410	7011219
		P-0814	J7A090287-3	JMLA41AE	9JMLA410	7011221
		P-0814	J7A090287-3	JMLA41AC	9JMLA410	7011225
		P-0814	J7A090287-3	JMLA42AD	9JMLA420	7029198
		P-0815 \	J7A090287-4	JMLA71AA	9JMLA710	7011219
		P-0815 ( *	J7A090287-4	JMLA71AE	9JMLA710	7011221
		P-0815	J7A090287-4	JMLA71AC	9JMLA710	7011225
		P-0815	J7A090287-4	JMLA72AD	9JMLA720	7029198



STL Richland rptSTLRchTitle v3.73



### Certificate of Analysis

February 6, 2007

Brown & Caldwell 2701 Prospect Park Drive Rancho Cordova, CA 95670

Attention: Guy Graening

STL Richland 2800 George Washington Way

Richland, WA 99354

Tel- 509 375 3131 Fax: 509 375 5590

www.sti-inc.com

Date Received at Lab

January 8, 2006

Project Name

Air Quality Monitoring Yerington Mine

Project Number

121243

Event Number PO Number

113

Sample Type

129682.001 Five (5) Filters

SDG Number

33444

### **CASE NARRATIVE**

### I. Introduction

On January 8, 2006, five filter samples were received at the STL Richland (STLR) laboratory for radiochemical analysis. Upon receipt, the samples were assigned the STLR identification numbers as described on the cover page of the Analytical Data Package report form. The samples were assigned to Lot Number J7A100118.

### II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

### III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information; analytical results and the appropriate associated statistical uncertainties.

The analysis requested was:

Alpha Spectroscopy

Thorium-228, -230, -232 by method RICH-RC-5087

**Gas Proportional Counters** 

Gross Alpha by method STL-RICHRC5016/5014

Radium-228 by method STL RICH-RC-5005

**Alpha Scintillation Counter** 

Radium-226 by method STL RICH-RC-5005

### IV. **Quality Control**

The analytical result for each analysis performed includes a minimum of one laboratory control sample (LCS), and one reagent blank sample analysis. Any exceptions have been noted in the "Comments" section.

### V. Comments

### Thorium-228, -230, -232:

A tracer was added to the LCS vial instead of a spike therefore there is no LCS in the batch. The process has been shown to be in control. Data is accepted. Except as noted, the LCS, batch blank and sample results are within analytical requirements.

### Gross Alpha Analysis:

The LCS, batch blank and sample results are within analytical requirements.

### Radium-228 Analysis:

The original analysis had a low LCS recovery of 72%. The batch was reanalyzed with good results. Data is accepted. Except as noted, The LCS, batch blank and sample results are within analytical requirements.

### Radium-226 Analysis:

The LCS, batch blank and sample results are within analytical requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. The Laboratory Manager or a designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Reviewed and approved:

Sherryl A Adam
Project

Project Manager

**Drinking Water Method Cross References** 

	DRINKING WAT	ER ASTM METHOD CROSS REFERENCES
Referenced Method	Isotope(s)	STL Richland's SOP number
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-2		
The Gross Beta LCS is prepared with Sr/Y-90	(unless otherwise	e specified in the case narrative)

### **Uncertainty Estimation**

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, R = constants \* f(x,y,z,...). The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties  $(u_i)$  are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty  $(u_c)$  multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/vn), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

	Report Definitions
Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or STL Richland.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) u <sub>c -</sub> Combined Uncertainty.	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, $u_c$ the combined uncertainty. The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Chent's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
Le	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. Lc=(1.645 * Sqrt(2*(BkgrndCnt/BkgrndCntMin)/SCntMin)) * (ConvFct/(Eff*Yld*Abn*Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency. Chemical Yield, and Volume

•	sample number is a sequential number assigned to each sample in the Lot.
MDC MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. MDC = (4.65 ×

Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) \* (ConvFct/(Eff \* Yld \* Abn \* Vol) \* IngrFct). For LSC methods the batch blank is used as a measure of the background variability.

Primary Detector The instrument identifier associated with the analysis of the sample aliquot.

Ratio U-234/U-238 The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.

Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.

Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than I may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.

Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number.

The equation Replicate Error Ratio =  $(S-D)/[sqrt(TPUs^2 + TPUd^2)]$  as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample.

Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.

The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.

The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

The LIMS software assign test specific identifier.

STL Richland rptGeneralInfo v3.72 STL RICHLAND

Yield

Rst/MDC

Rst/TotUcert

Report DB No

Sum Rpt Alpha

Spec Rst(s)

Work Order

RER

SDG

RE: Event 113

### Konstadina Vlahogiani

From:

Adam, Sherryl [SAdam@stl-inc.com]

Sent:

Tuesday, March 06, 2007 11:50 AM

To:

Konstadina Vlahogiani

Cc:

Kocsis, Susie

Subject:

RE: Event 113

Attachments: gpc5\_5-mar-2007-16042566.pdf; alp120\_5-mar-2007-16165816.pdf; asc10\_5-mar-2007-16045969.pdf; asc16\_5-mar-2007-16050798.pdf; asc18\_5-mar-2007-16051593.pdf; asc21\_5-

mar-2007-16052375.pdf; asc24\_5-mar-2007-16052991.pdf

Here you go.

From: Konstadina Vlahogiani [mailto:dvlahogi@envstd.com]

Sent: Monday, March 05, 2007 10:22 AM

**To:** Adam, Sherryl Cc: Kocsis, Susie

Subject: RE: Event 113

Sherryl,

Could you please let me know when I can expect the calibrations for Event 113?

Susie and Guy are trying to finish their report this week.

Thanks.

Dina

From: Konstadina Vlahogiani

Sent: Monday, February 26, 2007 2:13 PM

To: 'Adam, Sherryl' Cc: 'Kocsis, Susie' Subject: Event 113

Sherryl,

For isotopic thorium: the calibration check for ALP 120 (analysis date 1/18/07) is missing.

For Ra-228: the background check for GPC 5 (analysis date 2/1/07) is missing.

For Ra-226: the calibration checks for detectors 10, 16, 18, 21, and 24 (analysis date 1/24/07) are missing.

Dina

Confidentiality Notice: The information contained in this message is intended only for the use of the addressee, and may be confidential and/or privileged. If the reader of this message is not the intended recipient, or the employee or agent responsible to deliver it to the intended recipient, you are hereby

RE: Event 113 Page 2 of 2

notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify the sender immediately.

RE: Event 113 Page 1 of 2

### Konstadina Vlahogiani

From:

Adam, Sherryl [SAdam@stl-inc.com]

Sent:

Tuesday, March 06, 2007 11:50 AM

To:

Konstadina Vlahogiani

Cc: Subject: Kocsis, Susie RE: Event 113

**A**44 L 4

Attachments: gpc5\_5-mar-2007-16042566.pdf; alp120\_5-mar-2007-16165816.pdf; asc10\_5-mar-2007-16045969.pdf; asc16\_5-mar-2007-16050798.pdf; asc18\_5-mar-2007-16051593.pdf; asc21\_5-

mar-2007-16052375.pdf; asc24 5-mar-2007-16052991.pdf

Here you go.

From: Konstadina Vlahogiani [mailto:dvlahogi@envstd.com]

Sent: Monday, March 05, 2007 10:22 AM

**To:** Adam, Sherryl **Cc:** Kocsis, Susie

**Subject:** RE: Event 113

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Susie and Guy are trying to finish their report this week.

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From: Konstadina Vlahogiani

Sent: Monday, February 26, 2007 2:13 PM

To: 'Adam, Sherryl' Cc: 'Kocsis, Susie' Subject: Event 113

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For Ra-228: the background check for GPC 5 (analysis date 2/1/07) is missing.

For Ra-226: the calibration checks for detectors 10, 16, 18, 21, and 24 (analysis date 1/24/07) are missing.

Dina

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3/6/2007

RE: Event 113 Page 2 of 2

notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify the sender immediately.

### Konstadina Vlahogiani

From:

Adam, Sherryl [SAdam@stl-inc.com]

Sent:

Tuesday, March 06, 2007 2:08 PM

To:

Konstadina Vlahogiani

Cc:

Kocsis, Susie

Subject:

RE: Event 113

Attachments: gpc5\_6-mar-2007-11023758.pdf

From: Konstadina Vlahogiani [mailto:dvlahogi@envstd.com]

Sent: Tuesday, March 06, 2007 10:06 AM

**To:** Adam, Sherryl **Cc:** Kocsis, Susie

Subject: FW: Event 113

Sherryl,

For Ra-228 you sent me the efficiency check for gpc5. As I said in my email, I need the background check.

Dina

From: Adam, Sherryl [mailto:SAdam@stl-inc.com]

Sent: Tuesday, March 06, 2007 11:50 AM

To: Konstadina Vlahogiani

Cc: Kocsis, Susie

Subject: RE: Event 113

Here you go.

From: Konstadina Vlahogiani [mailto:dvlahogi@envstd.com]

Sent: Monday, March 05, 2007 10:22 AM

**To:** Adam, Sherryl **Cc:** Kocsis, Susie

Subject: RE: Event 113

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Thanks,

Dina

From: Konstadina Vlahogiani

RE: Event 113 Page 2 of 2

Sent: Monday, February 26, 2007 2:13 PM

To: 'Adam, Sherryl' Cc: 'Kocsis, Susie' Subject: Event 113

Sherryl,

For isotopic thorium: the calibration check for ALP 120 (analysis date 1/18/07) is missing.

For Ra-228: the background check for GPC 5 (analysis date 2/1/07) is missing.

For Ra-226: the calibration checks for detectors 10, 16, 18, 21, and 24 (analysis date 1/24/07) are missing.

### Dina

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RADIOLOGICAL FIELD DUPLICATE EVALUATION

REPLICATE ERROR RATIO (RER) LIMIT < 1.96

RER = ABS (SAMPLE ACT - DUPLICATE ACT) / SQRT [(TPU SAMPLE)2 + (TPU DUPLICATE)2]

### Event 113

Samples: P-0812 and P-0815

Analyte	Sample Act	Sample TPU	<b>Duplicate Act</b>	Duplicate TPU	RER	Qualifier
alpha	7.36	4.3	8.52	4.3	0.191	
th-230	0.303	0.22	0.0954	0.12	0.828	

# Sample Results Summary STL Richland STLR

Date: 06-Feb-07

Ordered by Client Sample ID, Batch No.

**Report No.: 34418** 

**SDG No**: 33442

Client ID	Work Order Number	Parameter	Result +- Uncertainty ( 2s)	Qual Units	Yield	MDC MDA RER
000580	JMLA81AA	TH-228	0.115 +- 0.148	ND pCi/sample	89%	0.247
		TH-230	0.365 +- 0.238	= pCi/sample	89%	0.195
		TH-232	0.0276 +- 0.0705	ND pCi/sample	89%	0.165
000580	JMLA81AE	ALPHA	12.5 +- 5.27	= pCi/sample	100%	4.49
000580	JMLA81AC	RA-226	0.520 +- 0.298	= pCi/sample	91%	0.312
000580	JMLA82AD	RA-228	0.902 +- 1.04	ND pCi/sample	88%	2.3
P-0812	JMK811AA	TH-228	0.00000395 +- 0.168	ND pCi/sample	95%	0.425
		TH-230	0.303 +- 0.223	= pCi/sample	95%	0.227
		TH-232	-0.0378 +- 0.0929	ND pCi/sample	95%	0.278
P-0812	JMK811AE	ALPHA	7.36 +- 4.25	= pCi/sample	100%	5.37
P-0812	JMK811AC	RA-226	-0.0186 +- 0.422	ND pCi/sample	101%	0.804
P-0812	JMK812AD	RA-228	1.15 +- 1.19	ND pCi/sample	86%	2.59
P-0813	JMLA11AA	TH-228	0.0779 +- 0.366	ND pCi/sample	44%	0.839
		TH-230	0.224 +- 0.272	ND pCi/sample	44%	0.448
		TH-232	0.00000 +- 0.167	ND pCi/sample	44%	0.448
P-0813	JMLA11AE	ALPHA	5.02 +- 3.19	= pCi/sample	100%	3.81
P-0813	JMLA11AC	RA-226	0.269 +- 0.430	ND pCi/sample	101%	0.745
P-0813	JMLA12AD	RA-228	0.443 +- 0.956	ND pCi/sample	93%	2.19
P-0814	JMLA41AA	TH-228	0.186 +- 0.257	ND pCi/sample	83%	0.446
		TH-230	0.127 +- 0.185	ND pCi/sample	83%	0.305
		TH-232	-0.0254 +- 0.114	ND pCi/sample	83%	0.305
P-0814	JMLA41AE	ALPHA	10.2 +- 4.86	= pCi/sample	100%	5.17
P-0814	JMLA41AC	RA-226	-0.2010 +- 0.298	ND pCi/sample	106%	0.655
P-0814	JMLA42AD	RA-228	0.859 +- 1.16	ND pCi/sample	88%	2.57
P-0815	JMLA71AA	TH-228	0.164 +- 0.163	ND pCi/sample	100%	0.201
		TH-230	0.0954 +- 0.120	ND pCi/sample	100%	0.163
		TH-232	0 0204 +- 0.0709	ND pCi/sample	100%	0.193
P-0815	JMLA71AE	ALPHA	8.52 +- 4.33	= pCi/sample	100%	4.52
P-0815	JMLA71AC	RA-226	0.422 +- 0.357	ND pCi/sample	106%	0.503
°-08 <b>1</b> 5	JMLA72AD	RA-228	0.325 +- 1.08	ND pCi/sample	82%	2.54

STL Richland

RER2 - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

rptSTLRchSaSum V5.1 A2002 = ERPIMS - Equal To, Analyte Detected

ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by ganuna scan software.

PF 1 1 1 1

## Sample Results Summary

STL Richland STLR
Ordered by Client Sample ID, Batch No.

**Report No.: 34418** 

Date: 06-Feb-07

**SDG No:** 33442

	Work Order							
Client ID	Number	Parameter	Result +- Uncertainty ( 2s)	Qual	Units	Yield	MDC MDA	RER2
Number of Results:	20							

STL Richland

RER2 - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

rptSTLRchSaSum V5.1 A2002

### QC Results Summary STL Richland STLR

Date: 06-Feb-07

Ordered by QC Type, Batch No.

**Report No.: 34418** 

**SDG No.:** 33442

QC Type	Work Order Number	Parameter	Result +- Uncer	rtainty ( 2s)	Qual	Units	Yield	Recovery	Blas	MDC MDA
BLANK QC	JMN8F1AA	TH-228	0.00985 +	0.0173	N	pCi/sample	95%			0.0331
		TH-230	0.00754 +	0.0114	Ν	pCi/sample	95%			0.0226
		TH-232	0.00000 +	- 0.00843	N	pCi/sample	95%			0.0226
BLANK QC	JMN8V1AA	ALPHA	0.000224 +	0.00252	Ν	pCi/sample	100%			0.00646
BLANK QC	JMN851AA	RA-226	0.000186 +	0.000442	N	pCi/sample	93%			0.000812
BLANK QC	JMN9F2AA	RA-228	0.102 +	0.216	N	pCi/sample	99%			0,491
LCS	JMN8V1AC	ALPHA	0.167 +	0.0437	=	pCi/sample	100%	93%	-0.1	0.00711
LCS	JMN851AC	RA-226	0.00728 +	0.00188	=	pCi/sample	104%	79%	-0.2	0.000524
LCS	JMN9F2AC	RA-228	5.49 +	0.825	=	pCi/sample	86%	107%	0.1	0.542

Number of Results:

.

STL Richland rptSTLRchQcSum

V5.1 A2002

- (Result/Expected)-1 as defined by ANSI N13.30.

= ERPIMS - Equal To, Analyte Detected

Date: 06-Feb-07

Lab Name:

STL Richland

SDG:

33442

Collection Date: 12/5/2006 12:50:00 PM

Lot-Sample No.: J7A090287-5

Report No.:

34418

**Received Date:** 

1/8/2007 10:00:00 AM

Client Sample ID: 000580

COC No.:

Matrix:

**FILTER** 

AIR

Yerington N	Mine - Event	#113								Ordere	ed by Client	Sample ID, Batch No
Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcer	Analysis, t Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 7011219	Work Ord	er: JML	_A81AA	Report DB II	): 9JMLA810							
TH-228	0.115	ND	0.15	0.15	0.247	pCi/sample	89%	0.47	1/17/07 10:04 p	1.0	0.08345	ISOTH
						0.0749	1.0	(1.6)		Sample	Sample	ALP118
TH-230	0.365	=	0.23	0.24	0.195	pCi/sample	89%	(1.9)	1/17/07 10:04 p	1.0	0.08345	ISOTH
						0.0507	1.0	(3.1)		Sample	Sample	ALP118
TH-232	0.0276	ND	0.070	0.070	0.165	pCi/sample	89%	0.17	1/17/07 10:04 p	1.0	0.08345	ISOTH
					0.0359	1.0	0.78		Sample	Sample	ALP118	
Batch: 7011221	Work Ord	er: JML	A81AE	Report DB ID	): 9JMLA810		••					
ALPHA	12.5	=	4.4	5.3	4.49	pCi/sample	100%	(2.8)	1/23/07 07:52 p	1.0	0.02094	E900.0
						1.81	20.0	(4.7)		Sample	Sample	GPC10F
Batch: 7011225	Work Ord	er: JML	A81AC	Report DB ID	: 9JMLA810							
RA-226	0.520	=	0.28	0.30	0.312	pCi/sample	91%	(1.7)	1/24/07 02:24 p	1.0	0.25066	E903.1
						0.118	1.0	(3.5)		Sample	Sample	ASCJMB
Batch: 7029198	Work Ord	er: JML	A82AD	Report DB ID	; 9JMLA820							
RA-228	0.902	ND	1.0	1.0	2.3	pCi/sample	88%	0.39	2/2/07 06:06 a	1.0	0.24979	E904.0
						1.05	3.1	(1.7)		Sample	Sample	GPC1D
								.,				

Number of Results: 6

Comments:

STL Richland rptSTLRchSample

V5.1 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

= ERPIMS - Equal To, Analyte Detected

Date: 06-Feb-07

Lab Name:

STL Richland

SDG:

33442

Collection Date: 12/5/2006 12:25:00 PM

Lot-Sample No.: J7A090287-1

Report No.: 34418 Received Date:

Client Sample ID: P-0812

COC No.:

Matrix:

FILTER AIR

1/8/2007 10:00:00 AM

Ordered by Client Sample ID, Batch No. Yerington Mine - Event #113

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	•	Yield CRDL(RL)	Rst/MDC, Rst/TotUcer	Analysis, t Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 7011219	Work Ord	er: JM	(811AA	Report DB ID	): 9JMK8110							
TH-228	0.0000039	5 ND	0.17	0.17	0.425	pCi/sample	95%	0.	1/17/07 10:03 p	1.0	0.07881	ISOTH
						0.159	1.0	0.		Sample	Sample	ALP113
TH-230	0.303	=	0.22	0.22	0.227	pCi/sample	95%	(1.3)	1/17/07 10:03 p	1.0	0.07881	ISOTH
						0.0622	1.0	(2.7)		Sample	Sample	ALP113
TH-232	-0.0378	ND	0.093	0.093	0.278	pCi/sample	95%	-0.14	1/17/07 10:03 p	1.0	0.07881	ISOTH
						0.088	1.0	-0.81		Sample	Sample	ALP113
Batch: 7011221	Work Ord	er: JM	(811AE	Report DB ID	): 9JMK8110							
ALPHA	7.36	=	3.9	4.3	5.37	pCi/sample	100%	(1.4)	1/23/07 07:52 p	10	0.01971	E900.0
						2.21	20.0	(3.5)		Sample	Sample	GPC10A
Batch: 7011225	Work Ord	er: JM	(811AC	Report DB ID	9JMK8110							
RA-226	-0.0186	ND	0.42	0.42	0.804	pCi/sample	101%	-0.02	1/24/07 02:00 p	1.0	0.23554	E903.1
						0.365	1.0	-0.09		Sample	Sample	ASC3HA
Batch: 7029198	Work Ord	er: JM	(812AD	Report DB ID	): 9JMK8120							
RA-228	1.15	ND	1.2	1.2	2.59	pCi/sample	86%	0.45	2/2/07 06:05 a	1.0	0.23579	E904.0
						1.18	3.1	(1.9)		Sample	Sample	GPC7A

Number of Results: 6

Comments:

STL Richland

V5.1 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

= ERPIMS - Equal To, Analyte Detected rptSTLRchSample

Date: 06-Feb-07

Lab Name:

STL Richland

SDG:

33442

Collection Date: 12/5/2006 12:10:00 PM

Lot-Sample No.: J7A090287-2

Report No.: 34418 Received Date:

1/8/2007 10:00:00 AM

Client Sample ID: P-0813 Yerington Mine - Event #113

COC No.:

Matrix:

**FILTER** AIR

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcer	Analysis, t Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 7011219	Work Ord	er: JML	A11AA	Report DB ID	9JMLA110							
TH-228	0.0779	ND	0.37	0.37	0.839	pCi/sample	44%	0.09	1/17/07 10:04 p	1.0	0.08298	ISOTH
						0.314	1.0	0.43		Sample	Sample	ALP114
TH-230	0.224	ND	0.27	0.27	0.448	pCi/sample	44%	0.5	1/17/07 10:04 p	1.0	0.08298	ISOTH
						0.123	1.0	(1.6)		Sample	Sample	ALP114
TH-232 0.00000	0.00000	ND	0.0000	0.17	0.448	pCi/sample	44%	0.	1/17/07 10:04 p	1.0	0.08298	ISOTH
					0.123	1.0	0.		Sample	Sample	ALP114	
Batch: 7011221	Work Ord	er: JML	A11AE	Report DB ID	: 9JMLA110							
ALPHA	5.02	æ	3.0	3.2	3.81	pCi/sample	100%	(1.3)	1/23/07 07:52 p	1.0	0.02076	E900.0
						1.44	20.0	(3.2)		Sample	Sample	GPC10B
Batch: 7011225	Work Ord	er: JML	A11AC	Report DB ID	: 9JMLA110							
RA-226	0.269	ND	0.43	0.43	0.745	pCi/sample	101%	0.36	1/24/07 01:53 p	1.0	0.2492	E903.1
						0.338	1.0	(1.2)		Sample	Sample	ASC6RA
Batch: 7029198	Work Orde	er: JML	A12AD	Report DB ID	: 9JMLA120							
RA-228	0.443	ND	0.78	0.96	2.19	pCi/sample	93%	0.2	2/2/07 06:05 a	1.0	0.2493	E904.0
						0.997	3.1	0.93		Sample	Sample	GPC7B

Number of Results: 6

Comments:

STL Richland rptSTLRchSample

V5.1 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

= ERPIMS - Equal To, Analyte Detected

Date: 06-Feb-07

Lab Name:

STL Richland

SDG:

33442

Collection Date: 12/5/2006 12:45:00 PM

Lot-Sample No.: J7A090287-3

34418

Received Date:

1/8/2007 10:00:00 AM

AIR

Client Sample ID: P-0814

COC No.:

Report No.:

Matrix:

**FILTER** 

Yerington M	fine - Event #	±113								Ordere	ed by Client	Sample ID, Batch No.
Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcer	Analysis, t Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 7011219	Work Ord	er: JML	A41AA	Report DB ID	: 9JMLA410							
TH-228	0.186	ND	0.25	0.26	0.446	pCi/sample	83%	0.42	1/17/07 10:04 p	1.0	0.08115	ISOTH
						0.151	1.0	(1.4)		Sample	Sample	ALP116
TH-230	0.127	ND	0.18	0.18	0.305	pCi/sample	83%	0.42	1/17/07 10:04 p	1.0	0.08115	ISOTH
						0.0836	1.0	(1.4)		Sample	Sample	ALP116
TH-232	-0.0254	ND	0.11	0.11	0.305	pCi/sample	83%	-0.08	1/17/07 10:04 p	1.0	0.08115	ISOTH
					0.0836	1.0	-0.45		Sample	Sample	ALP116	
Batch: 7011221	Work Ord	er: JML	A41AE	Report DB ID	: 9JMLA410			•				
ALPHA	10.2	=	4.2	4.9	5.17	pCi/sample	100%	(2.)	1/23/07 07:52 p	1.0	0.02024	E900.0
						2.13	20.0	(4.2)		Sample	Sample	GPC10C
Batch: 7011225	Work Ord	er: JML	A41AC	Report DB ID	: 9JMLA410			•				. —
RA-226	-0.2010	ND	0.29	0.30	0.655	pCi/sample	106%	-0.31	1/24/07 02:00 p	1.0	0.24214	E903.1
						0.287	1.0	-(1.4)		Sample	Sample	ASCGSA
Batch: 7029198	 Work Ord	er: JML	A42AD	Report DB ID	: 9JMLA420				•			
RA-228	0.859	ND	1.2	1.2	2.57	pCi/sample	88%	0.33	2/2/07 06:05 a	1.0	0.24196	E904.0
						1.18	3.1	(1.5)		Sample	Sample	GPC1B

Number of Results: 6

Comments:

STL Richland rptSTLRchSample V5.1 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

= ERPIMS - Equal To, Analyte Detected

# FORM I **SAMPLE RESULTS**

Date: 06-Feb-07

Lab Name:

STL Richland

SDG:

33442

Collection Date: 12/5/2006 12:30:00 PM

Lot-Sample No.: J7A090287-4

Report No.: 34418 Received Date:

1/8/2007 10:00:00 AM

Ordered by Client Sample ID, Batch No.

Client Sample ID: P-0815

COC No.:

Matrix:

FILTER

AIR

Yerington Mine - Event #113

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcer	Analysis, t Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 7011219	Work Ord	er: JML	A71AA	Report DB ID	9JMLA710							
TH-228	0.164	ND	0.16	0.16	0.201	pCi/sample	100%	0.81	1/17/07 10:04 p	1.0	0.08039	ISOTH
						0.0523	1.0	(2.)		Sample	Sample	ALP117
TH-230	0.0954	ND	0.12	0.12	0.163	pCi/sample	100%	0.58	1/17/07 10:04 p	1.0	0.08039	ISOTH
						0.0354	1.0	(1.6)		Sample	Sample	ALP117
TH-232	0.0204	ND	0.071	0.071	0.193	pCi/sample	100%	0.11	1/17/07 10:04 p	1.0	0.08039	ISOTH
						0.0501	1.0	0.58		Sample	Sample	ALP117
Batch: 7011221	Work Ord	er: JML	A71AE	Report DB ID	9JMLA710							
ALPHA	8.52	=	3.8	4.3	4.52	pCi/sample	100%	(1.9)	1/23/07 07:52 p	1.0	0.02008	E900.0
						1.8	20.0	(3.9)		Sample	Sample	GPC10D
Batch: 7011225	Work Ord	er: JML	A71AC	Report DB ID	: 9JMLA710					-		
RA-226	0.422	ND	0.34	0.36	0.503	pCı/sample	106%	0.84	1/24/07 02:01 p	1.0	0.24099	E903.1
						0.2	1.0	(2.4)		Sample	Sample	ASCASC
Batch: 7029198	Work Ord	er: JML	A72AD	Report DB ID	: 9JMLA720							
RA-228	0.325	ND	0.89	1.1	2.54	pCi/sample	82%	0.13	2/2/07 06:06 a	1.0	0.24067	E904.0
						1.15	3.1	0.6		Sample	Sample	GPC1C

Number of Results: 6

Comments:

STL Richland rptSTLRchSample

V5.1 A2002

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

= ERPIMS - Equal To, Analyte Detected

ND Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software,

# **BLANK RESULTS**

Lab Name:

STL Richland

SDG:

33442

Lot-Sample No.: J7A110000-219

Report No.: 34418

Matrix: FILTER

Date: 06-Feb-07

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUce	,,	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 7011219	Work Orde	r: JMN8	BF1AA	Report DB ID:	JMN8F1AB		.,					
TH-228	0.00985	ND	0.017	0.017	0.0331	pCi/sample	95%	0.3	1/18/07 09:42 a	1.0	1.0	ISOTH
					0.0112	1.0		(1.1)		Sample	Sample	ALP119
TH-230	0.00754	ND	0.011	0.011	0.0226	pCi/sample	95%	0.33	1/18/07 09:42 a	1.0	1.0	ISOTH
					0.0062	1.0		(1.3)		Sample	Sample	ALP119
TH-232	0.00000	ND	0.0000	0.0084	0.0226	pCi/sample	95%	0.	1/18/07 09:42 a	1.0	1.0	ISOTH
					0.0062	1.0		0.		Sample	Sample	ALP119

Number of Results: 3

Date: 06-Feb-07

# **BLANK RESULTS**

Lab Name:

STL Richland

SDG:

33442

Lot-Sample No.: J7A110000-221

Report No.: 34418

Matrix: FILTER

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcer	Analysis, t Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 7011221	Work Order	: JMN8	BV1AA	Report DB ID:	JMN8V1AB							
ALPHA	0.000224	ND	0.0025	0.0025	0.00646	pCi/sample	100%	0.03	1/24/07 05:03 p	1.0	12.59	E900.0
					0.00247	20.0		0.18		Sample	Sample	GPC10B

Number of Results: 1

# **BLANK RESULTS**

Lab Name:

STL Richland

SDG:

33442

Lot-Sample No.: J7A110000-225

Report No.: 34418

Matrix: FILTER

Date: 06-Feb-07

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcer	Analysis, t Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 7011225	Work Order	: JMN8	51AA	Report DB ID:	JMN851AB							
RA-226	0.000186	ND	0.00044	0.00044	0.000812	pCi/sample	93%	0.23	1/24/07 04:19 p	1.0	152.17	E903.1
					0.000343	1.0		0.84		Sample	Sample	ASCMRA

Number of Results: 1

# **BLANK RESULTS**

Date: 06-Feb-07

Lab Name:

STL Richland

SDG:

33442

Lot-Sample No.: J7A110000-229

Report No.: 34418

Matrix: FILTER

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUce		Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 7029198	Work Order	: JMN9	F2AA	Report DB ID:	JMN9F2AB							
RA-228	0.102	ND	0.18	0.22	0.491	pCi/sample	99%	0.21	2/2/07 06:06 a	1.0	1.0	E904.0
					0.224	1.0		0.94		Sample	Sample	GPC5C

Number of Results: 1

LCS RESULTS

Date: 06-Feb-07

Lab Name:

STL Richland

SDG:

33442

Lot-Sample No.: J7A110000-221

Report No.: 34418

Matrix: FILTER

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 7011221	Work Ord	der: JM	N8V1AC	Report DB	ID: JMN8V	1CS							
ALPHA	0.167	=	0.019	0.044	0.00711	pCi/sample	100.00%	0.179	0.0056	93%	1/24/07 05:03 p	12.55	E900.0
							: Limits:			-0.1		Sample	GPC10A

Number of Results: 1

Date: 06-Feb-07

# **LCS RESULTS**

Lab Name:

STL Richland

SDG:

33442

Lot-Sample No.: J7A110000-225

Report No.: 34418

Matrix: FILTER

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 7011225	Work Ord	er: JM	N851AC	Report DB	ID: JMN85	ics							
RA-226	0.00728	=	0.0011	0.0019	0.000524	pCi/sample	104.34%	0.00919	0.00014	79%	1/24/07 04:20 p	150.1	E903.1
						Red	: Limits:	70.	130.	-0.2		Sample	ASCOMB

Number of Results: 1

# Date: 06-Feb-07

# LCS RESULTS

Lab Name:

STL Richland

SDG:

33442

Lot-Sample No.: J7A110000-229

**Report No.:** 34418

Matrix: FILTER

Parameter	Result	Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDCIMDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 7029198	Work Ord	ler: JM	N9F2AC	Report DB I	D: JMN9F	2CS						"	
RA-228	5.49	=	0.54	0.83	0.542	pCi/sample	86.22%	5.15	0.16	107%	2/2/07 06:06 a	1.0	E904.0
						Rec	Limits:	70.	130.	0.1		Sample	GPC5D
******											-		_ · · · · ·

Number of Results. 1

# CHAIN OF CUSTODY

STL RICHLAND 21

# BROWN AND CALDWELL J7A090287 33 442

# CHAIN OF CUSTODY RECORD

COC No.
---------

☐ 3264 Goni Road / Suite 153 Carson City, NV 89706 775-883-4118 / FAX 775-883-5108

☐ 4425 W. Spring Mountain Road / Suite 225 Las Vegas, NV 89102 702-938-4080 / FAX 702-938-4082

☐ 201 East Washington Street / Suite 500 Phoenix, AZ 85004 602-567-4000 / FAX 602-567-4001

PRO		. 11 JH;							LABORATORY NAME & ADDRESS		14 kg #;			•		!
PRO	JECT NUMBER:				-		7	, <u>-</u>						1 LUT#		LZ
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LINE NO.	SAMPLE - I.D.	DATE	TIME	SAMPLER'S INITIALS	NUMBER OF CONTAINERS	CONTAINER SIZE AND TYPE	PRESER. VATIVE	MATRIX	ANALYSES REQUESTED			FIELD FILTERED	OC - REG	250/hc	SAMPLING METHOD	DEPTH (FT.) BEGIN END
,			1 75	N.S.	:	acid a Filher	Builble	8,	•2.0, Gross Alpres (h.D 130, B.a.), prend Control Science, Sci. Sci. Serbna.		<sup>ያ ነገብ፣</sup>			. phi	-	
2	richte de la company	í	2.15		١	8ml (Filter	NEWE	1	of the Paris Millian The 228, 180 - Rar 22 Age of the Court Mr. Was Suffer Al	6 328 1, 1 . <b>J</b>	10 K 55			7		
3	F-624	:	12 45	:	1	Ex * () Piper	73 W.E.	^	न्याः Gross (lpha: तीर्थार्थ) हेन्द्रीय हैन्द्रीय कहर्त्वत राज्याम् Mudelk Sulfate	6 2288 0 T	Aetais NLAY			- 27		
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ECC	ORD RETURNED BY:			DATE	TIM	E										

USE A BALLPOINT PEN, BLACK INK, AND PRESS FIRMLY. INSTRUCTIONS ARE ON THE BACK.

# STL STL

# Sample Chamen List

Date Time Received 1/8	107 10:00	
		142 NA! 1 SAFI
Work Order Number Jtw	+860107	Chain of Custocy # Event 113
Shipping Containe: ID		An Bill#
Custody Seals on s	rapping contenter intact	NA , Yes Ville
2 Custody Seals date	d and signed"	MANA YES / MAN
3 Chain of Custody i	ecord present?	Yes / No. 1
4 Cooler temperature	ANY S	Vermicante packing membah is NZ, je W. or Jay is
5 Number of sample	s in shipping contains: _	5
7. Sample holding tir	nes exceeded?	NA 19 Yes ( ) No.
3. Samples have:tupecustody seat	š	The first of the sample. Tag
Samples arein good conbroken	dit-on	leading The can burnle: (Unly for sumples regards glicing had
10. Sample pH taken?	Filter NAIN DH	(2 [] [H32 [] [255 []
	Sample Collector fusied on only. No conjective a	
Li Were any anomas	ies adentified in sample i	oceipt? Yes ( , Mr /
il Description of acc	omar es (include san ple	number;
Sample Custodian	Eine Duby	Date: 1/8/07 10:00
C iont Sample ID		Condulor Constraints to
	b)	2 son - a cros
[ ] No action necessary, pr		
Project Manager	Auditorial particular and desirable to a summing age of automorphisms of the second	<u></u>

# THORIUM SAMPLE AND QC DATA

STL RICHLAND 24

SEVERN	ST	Nietzen.

# Data Review/Verification Checklist RADIOCHEMISTRY, First Level Review

1/23/2007 3:39:34 PM

Yeş No N/A

Yeş No N/A

Yeşı No N/A

No N/A

No N/A

No N/A

Yes Nov N/A

Yes No N/A

Yes No N/A

No N/A

No N/A

No N/A

No N/A

Yes No N/A

Yeş No N/A

Yeş No N/A

Yeş No N/A

Yeş No N/A

No N/A

No N/A

No N/A

Yeş

SEVERN ST
Lot No., Due Date:
Client, Site:
QC Batch No., Metho
SDG, Matrix:
Joba, Maria.
1.0 COC 1.1 is the ICOC page co

J7A090287, J7A100115, J7A100118; 02/06/2007

536403; AIR MONITORING Yerington Mine

d Test: 7011219; RTHISO Thiso by ALP

33442,33443,33444; FILTER

ט.ון								
11.1	Is the ICOC I	page comple	ete: includes al	Lapplicable	analysis.	dates.	SOP numbers.	and revisions?

# tailed Reports include a calculated result for each sample listed on the QC Batch Sheet?

2.2 Are the QC appropriate for the analysis included in the batch?

- 2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc?
- 2.4 Does the Worksheets include a Tracer Vial label for each sample?

#### 3.0 QC & Samples

- 3.1 is the blank results, yield, and MDA within contract limits?
- 3.2 Is the LCS result, yield, and MDA within contract limits?
- 3.3 Are the MS/MSD results, yields, and MDA within contract limits?
- 3.4 Are the duplicate result, yields, and MDAs within contract limits?
- 3.5 Are the sample yields and MDAs within contract limits?

#### 4.0 Raw Data

- 4.1 Were results calculated in the correct units?
- 4.2 Were analysis volumes entered correctly?
- 4.3 Were Yields entered correctly?
- 4.4 Were spectra reviewed/meet contractual requirements?
- 4.5 Were raw counts reviewed for anomalies?

#### 5.0 Other

- 5.1 Are all nonconformances included and noted?
- 5.2 Are all required forms filled out?
- 5.3 Was the correct methodology used?
- 5.4 Was transcription checked?
- 5.5 Were all calculations checked at a minimum frequency?
- 5.6 Are worksheet entries complete and correct?
- 6.0 Comments on any No response:
  See NCM 2 6.4333

Claretazione

1-23-02

STL Richland

QAS\_RADCALCv4.8.26

First Level Review

STL RICHLAND

Page 1



# Data Review Checklist RADIOCHEMISTRY Second Level Review

	7011219	
QC Batch Number:	101121	

Review Item	Yes (V)	No (V)	N/A (√)
A. Sample Analysis			
. Are the sample yields within acceptance criteria?	/	1	
. Is the sample Minimum Detectable Activity < the Contract			
Detection Limit?			
3. Are the correct isotopes reported?			
3. QC Samples	<del>                                     </del>	<del> </del>	
I. Is the Minimum Detectable Activity for the blank result ≤ the			
Contract Detection Limit?		1	
2. Does the blank result meet the Contract criteria?	/		
3. Is the blank result < the Contract Detection Limit?			
4. Is the blank result > the Contract Detection Limit but the sample			
result < the Contract Detection Limit?			
5. Is the LCS recovery with contract acceptance criteria?			
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection			
Limit?			_
8. Do the MS/MSD results and yields meet acceptance criteria?			
9. Do the duplicate sample results and yields meet acceptance			
criteria?			
C. Other			
1. Are all Nonconformances included and noted?			
2. Are all required forms filled out?			
3. Was the correct methodology used?			
4. Was transcription checked?			
5. Were all calculations checked at a minimum frequency?			
6. Were units checked?			
Comments on any "No" response: See MCM			·

1/15/2007 12.30:41 PM Sample Preparation/Analysis Balance Id:1120373922 536403. Brown and Caldwell Brown & 9N Thiso PrpRc5016, SepRC5084(5003) Pipet #: Caldwell \$1 Thorium-228,230,232 by Alpha Spec 01 STANDARD TEST SET Sep1 DT/Tm Tech: AnalyDueDate: 02/05/2007 FILTER Batch: 7011219 pCi/sampl PM, Quote: SA, 63174 Sep2 DT/Tm Tech: SEQ Batch, Test: None Prep Tech: WoodT Work Order, Lot, Total Amt Total Initial Aliquot Adj Aliq Amt QC Tracer Count Detector Count On | Off CR Analyst, Comments: Acidified/Unit Amt/Unit (Un-Acidified) Prep Date Time Min Sample Date /Unit (24hr) Circle Init/Date 8 JMLT7-1-AA 0.833sa,g 527.80sa,q 50.28g,in 0.0794g **THTF0944** 900 12/18/06,pd J7A100115-3-SAMP 10/04/04,r 12/11/2006 12:15 AmtRec: FILTER #Containers: 1 Scr: Alpha: Beta: 9 JMLT8-1-AA 0.833sa,q 503.04sa,g 50.21g,in 0.0831g **THTF0945** 12/18/06,pd J7A100115-4-SAMP 10/04/04,r 12/11/2006 11:45 AmtRec: FILTER #Containers: 1 Scr: Alpha: Beta: 10 JMLVA-1-AA 0.833c511.47g 50.36g,in 0.082gTHTF0946 12/18/06.pd J7A100115-5-SAMP 10/04/04,r 6 AmtRec: FILTER 12/11/2006 12:20 #Containers: 1 Scr. Alpha: Beta: 0.833g 11 JMLVW-1-AA 50.39g,in **THTF0947** 502.79g 0.0835q12/18/06.pd J7A100118-1-SAMP 10/04/04,1 AmtRec: FILTER 12/13/2006 12:10 #Containers: 1 Scr. Alpha. Beta. **THTF0948** 12 JMLV3-1-AA 0.833sa,g 507.51sa,g 50.55q,in 0.083q12/18/06.pd J7A100118-2-SAMP 10/04/04,1 12/13/2006 12:43 AmtRec: FILTER #Containers: 1 Scr: Alpha: Beta: THTF0949 13 JMLV5-1-AA 0.833sa,q 510.86sa.q 50.31g,in 0.082q12/18/06.pd J7A100118-3-SAMP 10/04/04,r 12/13/2006 13:15 AmtRec: FILTER #Containers: 1 Scr: Alpha: Beta: THTF0950 14 JMLV8-1-AA 504.92sa,g 50.19g,in 0.0828g 0.833sa,g 12/18/06.pd J7A100118-4-SAMP 10/04/04,r 12/13/2006 13:18 AmtRec: FILTER #Containers: 1 Scr: Alpha: Beta: ISV - Insufficient Volume for Analysis WO Cnt: 14 STL Richland Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 Page 2 Prep SampiePrep v4.8.26 pd - Prep Dt. r - Reference Dt. ec-Enrichment Cell, ct-Cocktailed Added Richland Wa.

Sample Preparation/Analysis 1/15/2007 12:30:39 PM Balance Id:1120373922 STL 536403, Brown and Caldwell . Brown & 9N Thiso PrpRc5016, SepRC5084(5003) Pipet #: Caldwell Caldwell S1 Thorium-228,230,232 by Alpha Spec Sep1 DT/Tm Tech: 01 STANDARD TEST SET AnalyDueDate: 02/05/2007 PM, Quote: SA, 63174 Batch: 7011219 FILTER pCi/sampl Sep2 DT/Tm Tech: HLAND All Tests: 7011219 9NS1, 7011221 BAS7, 7011225 BXTE, 7011229 BXTF, SEQ Batch, Test: None Prep Tech: WoodT Count On | Off Adj Aliq Amt Detector CR Analyst, Comments: Work Order, Lot, Total Amt Total Initial Aliquot QC Tracer Count Amt/Unit (Un-Acidified) Prep Date Time Min (24hr) Circle Init/Date Acidified/Unit Sample Date /Unit **THTF0937** 500 1 JMK81-1-AA 0.833sa,q 531.15sa,q 50.25q,in 0.0788g 12/18/06,pd J7A090287-1-SAMP 10/04/04 r Scr: Alpha: Beta: AmtRec: FILTER #Containers: 1 12/05/2006 12:25 **THTF0938** 502.71sa,q 50.08g in 0.083q2 JMLA1-1-AA 0.833sa,q 12/18/06,pd J7A090287-2-SAMP 10/04/04,r Scr: Alpha: Beta: 12/05/2006 12:10 AmtRec: FILTER #Containers: 1 THTF0939 3 JMLA4-1-AA 0.833sa.g 516.54sa.q 50.32g,in 0.0811g 12/18/06,pd J7A090287-3-SAMP 10/04/04,r Scr. Alpha: Beta: AmtRec: FILTER #Containers: 1 12/05/2006 12:45 **THTF0940** 50.12g,in 0.0804q4 JMLA7-1-AA 0.833sa,q 519.32sa.q 12/18/06,pd J7A090287-4-SAMP 10/04/04.r Scr: Alpha: Beta: AmtRec: FILTER #Containers: 1 12/05/2006 12:30 **THTF0941** 0.0835q500.78sa,q 50.17g,in 5 JMLA8-1-AA 0.833sa,g 12/18/06,pd J7A090287-5-SAMP 10/04/04,1 Scr. Alpha: Beta: AmtRec: FILTER #Containers: 1 12/05/2006 12:50 THTF0942 0.833sa,g 524.49sa,g 50.25g,in 0.0798q6 JMLT2-1-AA 12/18/06,pd J7A100115-1-SAMP 10/04/04,r Scr: Alpha: Beta: 12/11/2006 11:40 AmtRec: FILTER #Containers: 1 THTF0943 0.0784g7 JMLT6-1-AA 0.833sa.g 532.31sa,q 50.10g,in 12/18/06,pd J7A100115-2-SAMP 10/04/04,r Scr. Alpha: Beta: AmtRec: FILTER #Containers: 1 12/11/2006 12:00 WO Cnt: 7 ISV - Insufficient Volume for Analysis Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 Page 1 STL Richland Prep\_SamplePrep v4.8.26 pd - Prep Dt, r - Reference Dt, ec-Enrichment Cell, ct-Cocktailed Added Richland Wa.

1/15/2007 12:3	):41 PM			Sample	Preparation/A	nalysis		Balance	e ld:11203739	)22
536403, Brown : Caldwell	and Caldwell	, Brow	S1 Th	orium-228,230,	, SepRC5084(5003) 232 by Alpha Spec			•	oet #:	
AnalyDueDate	02/05/2007		01 S1	ANDARD TEST	SET			Sep1 DT/Tm T	ech:	
Batch: 701121		pCi/s	ampl		PM, Quote: SA, 6	3174		Sep2 DT/Tm T	ech:	
Sulon, rest	10/10			I I				Prep T	ech: WoodT	
Work Order, Lot, Sample Date	Total Amt /Unit	Total Acidified/Unit	Initial Aliq Amt/Un	uot Adj Aliq	Amt QC Tracer	Count	Detector Id	Count On   Off (24hr) Circle	CR Analy Init/Date	
15 JMLV9-1-AA J7A100118-5-SAM	0.833sa,g	511.81sa,g	50.14g,in	0.0816g	THTF0951 12/18/06,pd	500			· · · · · · · · · · · · · · · · · · ·	
12/13/2006 13:21			ımtRec: FILTER	#Containers: 1	10/04/04 <sub>,</sub> r		Scr:	Alpha:	···	Beta:
16 JMN8F-1-AA-B J7A110000-219-BL	<		50.31g,in	50.31g	THTF0952 12/18/06,pd	1/16	<u>, [1]</u>			
12/05/2006 12:25		A	.mtRec:	#Containers: 1	10/04/04,r		Scr:	Alpha;		Beta:
17 JMN8F-1-AC-C			50.04g,in	50.04g	THTE0183	J				
J7A110000-219-LC					11/28/06,pd 10/04/04,r					
12/05/2006 12:25		A	mtRec:	#Containers: 1			Scr:	Alpha:		Beta:
Comments:										
All Clients for	Batch:									
536403, Bro	m and Caldwel	1 		Brown & Caldwe		, SA , 63174	·			
	onstituent Lis D:1 D:1	t: pCi/sam LCI pCi/sam LCI			Th-230 Th-234	RDL:1	pCi/s pCi/s		UCL: UCL:115	RPD: RPD:20
MN8F1AA-BLK:										
	)L:1 )L:1	pCi/sam LCI pCi/sam LCI			Th-230 Th-234	RDL: 1	pCi/s pCi/s		UCL: UCL:115	RPD: RPD:20
MN8F1AC-LCS: Th-230 RI	L:1	pCi/sam LCI	.:70 UCL	:130 RPD:2	0 Th-234	RDL:	pCi/sa	am LCL:20	UCL:115	RPD:20
MK811AA-SAMP Ca Uncert Leve MN8F1AA-BLK:		Decay to Sal	t: Y Blk	Subt.: N	Sci.Not.: Y	DDRs: B				
STL Richland Richland Wa				, s1 - Sep1, s2 - Se		ISV - I	nsufficient Volume	for Analysis		WO Cnt: 17 rep_SamplePrep v4.8.26

# Clouseau Nonconformance Memo



NCM #: 10-09333

NCM Initiated By: Pam Anderson Date Opened: 01/23/2007

Date Closed:

Classification: Deficiency

Status: GLREVIEW

Production Area: Environmental - Prep

Tests: Thiso by ALP

Lot #'s (Sample #'s): J7A090287 (1,2,3,4,5),

J7A100115 (1,2,3,4,5), J7A100118 (1,2,3,4,5),

J7A110000 (219),

QC Batches: 7011219

Nonconformance: Technician Error

Subcategory: Laboratory error: prep error

# Problem Description / Root Cause

Name Pam Anderson Date 01/23/2007 Description

This Th in filter batch has no LCS in it. A tracer was added to the LCS sample

instead of a spike. The process has been shown to be in control. The data will be

accepted without the LCS.

#### **Corrective Action**

Name Pam Anderson <u>Date</u>

Corrective Action

01/23/2007 Note in case narrative.

#### **Client Notification Summary**

Client

Project Manager

Notified

Response How Notified

<u>Note</u>

Response

Response Note

#### **Quality Assurance Verification**

Verified By

**Due Date** 

<u>Status</u>

This section not yet completed by QA.

Notes

### Approval History

Date Approved

Approved By

Position

Date Printed: 1/23/2007

1/23/2007 3:32.08 PM

# ICOC Fraction Transfer/Status Report ByDate: 1/23/2006, 1/28/2007, Batch: '7011219', User: 'ALL Order By DateTimeAccepting

Batch Work O	rd CurStat	us Ac	cepting		Comments
011219					
IC	CalcC	WoodT	1/15/2007 3:28	:33 PM	
SC		wagarr	isBatched	1/11/2007 11:25.28 AM	ICOC_RADCALC v4.8 26
C		WoodT	Prep1C	1/15/2007 3:28:33 PM	RICH-RC-5016 REVISION 5
C		HarveyK	Sep1C	1/16/2007 5:39:41 PM	RICH-RC-5087 REV0
C		FABREM	Sep2C	1/17/2007 4:14:19 PM	RICH-RC-5039 REVISION 5
C		FABREM	Sep2C	1/17/2007 4:14:19 PM	RICH-RC-5039 REVISION 5
C		DAWKINSO	InCnt1	1/17/2007 4.28:31 PM	RICH-RD-0008 REVISION 4
C		BlackCL	CalcC	1/19/2007 5:27:44 AM	RICH-RD-0008 REVISION 4
0		HarveyK	1/16/2007 5:39	:41 PM	
С		FABREM	1/17/2007 4:14	:19 PM	
$\mathcal{C}$		DAWKINSO	1/17/2007 4:28	:31 PM	
C		BlackCL	1/19/2007 5:27	:44	

AC: Accepting Entry; SC: Status Change

STL Richland Richland Wa

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Grp Rec Cnt: 5 ICOCFractions v4.8.26

1/23/2007 3	32 07 PM		Rpt DB Trans	er log (Batch	Results)		
SDG or Batch	Rpt Db Id		LotSample Client Id	Matrix Received	Date Samp	le Date	
	9JMK81		t Oc Analysis Date Result J7A0902871 P-0812	Cnt Uncert Tot uncert in FILTER 1/8/2007		<u> </u>	olumes
TH-228	9NS1	0	1/17/2007 10:03:53 PM3.9481E-	8 376E 02 8.376E-02 4.3		0.953 1 0E+0	7.881E-2
TH-230	9NS1	0	1/17/2007 10:03:53 PM3.0258E-0	1.086E-01 1.116E-01 2.3		0.953 1 0E+0	7.881E-2
TH-232	9NS1	0	1/17/2007 10:03:53 PM-3.7821E-			0.953 1.0E+0	7.881E-2
33442	9JMLA1	_	J7A0902872 P-0813	FILTER 1/8/2007		2006 12:10:00 PM	/ 00 (E.Z.
TH 228	9NS1	0	1/17/2007 10:04:06 PM7.7868E-0	1 828E-01 1.829E-01 8.3		0 438 1.0F+0	3 298E-2
TH-230	9NS1	0	1/17/2007 10:04:06 PM2.2391E-	1 346E-01 1.362E-01 4.4		0 438 1.0E+0	3.298E-2
TH-232	9NS1	0	1/17/2007 10:04:06 PM0.0E+00		477E-01 PCi/SA	0.438 1.0E+C	3 298E 2
33442	9JMLA4	110	J7A0902873 P-0814	FILTER 1/8/2007		2006 12:45:00 PM	7 2 3 0 2 2
TH-228	9NS1	0	1/17/2007 10:04:25 PM1.8576E-0	1.273E-01 1.283E-01 4.4		0.833 ).0E+0	3 115E-2
TH-230	9NS1	0	1/17/2007 10:04:25 PM1.271E-0	9 165E-02 9.234E-02 3.0		0.833 1.0E+0	3 115E 2
TH-232	9NS1	0	1/17/2007 10:04:25 PM-2.5423E-			0.833 1.0E+0	3.115 <b>E</b> -2
33442	9JMLA7		J7A0902874 P-0815	FILTER 1/8/2007		2006 12:30:00 PM	3.1104.2
TH-228	9NS1	0	1/17/2007 10:04:10 PM1.636E-0	8.016E-02 8.133E-02 2.0		0.996 1.0E+0	3.039E-2
TH-230	9NS1	0	1/17/2007 10:04:10 PM9,5387E-	5.94E-02 5.994E-02 1.0		0.996 1.0E+0	3.039E-2
TH-232	9NS1	0	1/17/2007 10:04:10 PM2.044E-02		925E-01 PCI/SA	0.996 1.0E+0	3.039E-2
33442	9JMLA8		J7A0902875 000580	FILTER 1/8/2007		2006 12:50 00 PM	J.055E-2
TH-228	9NS1	0	1/17/2007 10:04.38 PM1.1513E-	7.339E-02 7.403E-02 2.		0 893 1.0E+0	3.345E-2
TH 230	9NS1	0	1/17/2007 10:04:38 PM3.6534E-	1.147E-01 1 188E-01 1.		0.893 1.0E+0	3.345E-2
Trt 232	9NS1	0	1/17/2007 10:04:38 PM <b>2.757E-0</b>	3.515E-02 3.523E-02 1.0		0.893 1.0E+0	3.345E-2
33443	9JMLT2	-	J7A1001151 P-0816	FILTER 1/8/2007		/2006 11:40:00 AM	3 3436-2
TH-228	9NS1	0	1/17/2007 10:04:53 PM <b>6.9525E-</b> I	8.978E-02 8.998E-02 3.			7.001E.0
TH-230	9NS1	0	1/17/2007 10:04:53 PM1.7867E-	9.209E-02 9.337E-02 3.			7.981E-2
TH-232	9NS1	0	1/17/2007 10:04:53 PM4.4668E-I	4.994E-02 5.009E-02 2.		1.034 1.0E+0 1.034 1.0E+0	7.981E-2 7.981E-2
33443	9JMLT6	-	J7A1001152 P-0817			/2006 12:00:00 PM	/ 90)E-2
7H-228	9NS1	0	1/17/2007 10:05:00 PM3.2653E-	1.361E-01 1.391E-01 3.			7.84E-2
TH-230	9NS1	0	1/17/2007 10:05:00 PM3.1463E-		145E-01 PCI/SA	0.925 1.0E+0 0.925 1.0E+0	7.84E-2
TH 232	9NS1	0	1/17/2007 10:05:00 PM <b>0.0E+00</b>		145E-01 PCI/SA	0.925 1.0E+0	7 84E-2
		-	J7A1001153 P-0818			/2006 12:15:00 PM	7 042-2
33443 TH-228	9JMLT7 9NS1	0	1/17/2007 10:06:45 PM1.0138E-		408E-01 PCI/SA		7.00: 5.0
TH-230	9NS1	0	1/17/2007 10:06:45 PM1.9537E-	4.368E-02 4.372E-02 2.		1 003 1 0E+0 1 003 1.0E+0	7.935E-2 7.935E-2
TH-230	9NS1	0	1/17/2007 10:06:45 PM-1.953/E-			1.003 1.0E+0	7.935E-2 7.935E-2
					• • • • • • • • • • • • • • • • • • • •	/2006 11:45:00 AM	7.935E-2
33443	9JMLT8				.709E-01 PCI/SA		201450
TH-228	9NS1	0	1/17/2007 10:06:45 PM <b>5.0395E</b> - 1/17/2007 10:06:45 PM <b>9.7115E</b> -			0.746 1.0E+0	3.314E 2
TH 230	9NS1	0	1/17/2007 10:06:45 PM <b>-2.4278E</b>	9.084E-02 9.125E-02 3.		0.746 1.0E+0 0.746 1.0E+0	3.314E-2 3.314E-2
1H-232	9NS1 9JMLV3		J7A1001182 P-0821			3/2006 12:43:00 PM	3,3146-2
33444			1/17/2007 10:06:45 PM2.1713E-				3.297E-2
TH 228	9NS1	0	1/17/2007 10:06:45 PM2.1713E-			0.883 1 0E+0 0 883 1 0E+0	
1H 230	9NS1	0					
TH-232	9NS1	0	1/17/2007 10:06:45 PM1.2578E-				3.297E-2
33444	9JMLV5		J7A1001183 P-0822	FILTER 1/8/2007			ם ומתחבי ב
TH-228	9NS1	0	1/17/2007 10:06:45 PM-4.4948E			0 869 1.0E+0	
TH-230	9NS1	0	1/17/2007 10:06:45 PM3.472E-0	1.247E-01 1.283E-01 2.		0.869 1.0E+0	
TH-232	9NS1	0	1/17/2007 10:06:45 PM <b>0.0E+00</b>		.603E-01 PCI/SA	0.869 1.0E+0	3 203E-2
33444	9JMLV8		J7A1001184 P-0824			3/2006 1:18:00 PM	11125.0
1H 228	9NS1	0	1/17/2007 10:06:45 PM0.0E+00		705E-01 PCI/SA	0.55 1 0E+0	
TH-230	9NS1	0	1/17/2007 10:06:45 PM1.136E-0	1.136E-01 1 141E-01 4		0.55 1 0E+0	
Th-232	9NS1	0	1/17/2007 10:06:45 PM1.136E-0	1.136E-01 1.141E-01 4		0.55 1.0E+0	3.28E-2
33444	9JMLV9		J7A1001185 P-0582	FILTER 1/8/2007		3/2006 1:21.00 PM	
TH-228	9NS1	0	1/17/2007 10:06: <b>4</b> 5 PM <b>8.0735E</b> -			0.905 1.0E+0	
TH-230	9NS1	0	1/17/2007 10:06:45 PM <b>3,5078E</b>			0.905 1.0E+0	
TH-232	9NS1	0	1/17/2007 10:06.45 PM <b>0.0E+00</b>	0.0E+00 4.358E-02 2	338E-01 PCI/SA	0.905 1.0E+0	3 161E-2

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SDG or Batch	Rpt Db Id	LotSample	Client Id	Matrix	Recei	ved Date	Sample Date			
!so!ope	Method RTst Q		Re <u>sult</u>	Cnt Uncert			Units Expecte		Vol.	umes
33443	9JMLVA10	J7A1001155	000581	FILTE	R 1/8/20	07 10:00:00	12/11/2006 12·20:	00 PM		
TH-228	9NS1 0	1/17/2007 10:06:45	PM2.3414E-01	1.352E-01	1 369E-01	4.373E-01	PCI/SA	0 864	1 0E+0	3.202E-2
TH 230	9NS1 0	1/17/2007 10:06:45	PM2.5068E-01	1.149E-01	1.171E-01	3.007E-01	PCI/SA	0.864	1 0E+0	3 202E-2
TH-232	9NS1 0	1/17/2007 10:06:45	PM1.5041E-01	9.038E-02	9.143E-02	3.007E-01	PCVSA	0.864	1.0E+0	3.202E-2
33444	9JMLVW10	J7A1001181	P-0820	FILTE	R 1/8/20	07 10:00:00	12/13/2006 12:10	00 PM		
TH-228	9NS1 0	1/17/2007 10:06;45	PM8.4482E-02	8.448E-02	8.484E-02	3.378E-01	PCI/SA	0.801	1.0E+0	3.348E-2
TH-230	9NS1 0	1/17/2007 10:06:45	PM2.447E-01	1 246 <b>F</b> -01	1 266E-01	3.262E-01	PCI/SA	0.801	1 0E+C	3.3485-2
TH-232	9NS1 0	1/17/2007 10:06:45	PM5.4377E-02	6.079E-02	6.1E-02	3.262E-01	PCI/SA	0.801	1.0E+0	3.348E-2
33442	JMN8F1AB	J7A110000219	INTRA-LAB BLA	ANK FILTE	R 1/8/20	07 10:00:00	12/5/2006 12.25 0	0 PM		]
TH 228	9NS1 0 B	1/18/2007 9:42:22	AM 9.8479E-03	8.584E-03	8.627E-03	3.31E-02	PCI/SA	0.946	1.0E+0	1.0E+0
TH-230	9NS1 0 B	1/18/2007 9:42:22	AM 7.5416E-03	5.656E-03	5.695E-03	2.262E-02	PCI/SA	0.946	1.05+0	1.0E+0
TH-232	9NS1 0 B	1/18/2007 9:42:22	0.0E+00	0.0E+00	4.216E-03	2.262E-02	PCI/SA	0 946	1.0E+0	1.0E+0

STL Richland, Wa Calc Review v4.8.26

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<sup>7011219, \*\*</sup>Samples Inserted | Updated | NotUpdated => 16 | 0 | 0,

\*\*Results Inserted | ReTestInserted | Updated | NotInserted => 48 | 0 | 0 | 0.

\*\*Diff RptDb | Qtims => \*wo:JMN8F1AA=> , mat:FILTER | Air \*wo:JMN8F1AA=> , mat:FILTER | Air \*wo:JMN8F1AA=> , mat:FILTER | Air \*wo:JMN8F1AA=> .

Batch Nbr: 7011219

# Alpha Spec, Thiso by ALP , Results

1/19/2007 5:30:16 AM

					Sum	mary Re	po	rt						
Status N	leth	Matrix	Wrk Ord	Paramete	r Sa Act	Uncert	Q	Units	A	v ILcC	IDC	QC	Yield	RYId
Thiso b	y ALI	>	Ric	hland Stan	dard Alpiso	Wo Blk Su	bt.							
Calc S	1	FILTER	JMK811AA	TH-228	3.95E-06	(8.38E-02)	U4	PCI/SA	R	1.59E-01	4.25E-01		95%	
Calc S	1	FILTER	JMK811AA	TH-230	3.03E-01	(1.12E-01)	)	PCI/SA	R	6.22E-02	2.27E-01		95%	
Calc S	1	FILTER	JMK811AA	TH-232	-3.78E-02	(4.64E-02)	U4	PCI/SA	R	8.80E-02	2.78E-01		<b>9</b> 5%	
Calc S	i1	FILTER	JMLA11AA	TH-228	7.79E-02	(1.83E-01)	U4	PCI/SA	R	3.14E-01	8.39E-01		44%	/
Calc S	1	FILTER	JMLA11AA	TH-230	2.24E-01	(1.36E-01)	U4	PCI/SA	R	1.23E-01	4.48E-01		44%	
Calc S	1	FILTER	JMLA11AA	TH-232	0.00E+00	(8.35E-02)	U4	PCI/SA	R	1.23E-01	4.48E-01		44%	
Calc S	51	FILTER	JMLA41AA	TH-228	1.86E-01	(1.28E-01)	U4	PCI/SA	R	1.51E-01	4.46E-01		83%	
Calc S	31	FILTER	JMLA41AA	TH-230	1.27E-01	(9.23E-02)	U4	PCI/SA	R	8.36E-02	3.05E-01		83%	
Calc S	:1	EJI TER	IMI AA1AA	TH-232	-2 54E-02	(5.69E-02)	114	1 PCI/SA	R	8 36F-02	3.05E-01		83%	

Calc S1 FILTER JMLA41AA TH-232 -2.54E-02 (5.69E-02) U4 PCI/SA R 8.36E-02 3.05E-01 83% Calc S<sub>1</sub> **FILTER** JMLA71AA TH-228 1.64E-01 (8.13E-02) PCI/SA R 5.23E-02 2.01E-01 100% Calc S1 FILTER JMLA71AA TH-230 9.54E-02 (5.99E-02) U4 PCI/SA R 3.54E-02 1.63E-01 100% R 5.01E-02 1.93E-01 Calc S1 **FILTER** JMLA71AA TH-232 2.04E-02 (3.54E-02) U4 PCI/SA 100% S1 **FILTER** JMLA81AA TH-228 1.15E-01 (7.40E-02) U4 PCI/SA R 7.49E-02 2.47E-01 89% Calc Calc S<sub>1</sub> **FILTER** JMLA81AA TH-230 3.65E-01 (1.19E-01) PCI/SA R 5.07E-02 1.95E-01 89% (3.52E-02) U4 PCI/SA Calc S<sub>1</sub> FILTER JMLA81AA TH-232 2.76E-02 R 3.59E-02 1.65E-01 89% (9.00E-02) U4 PCI/SA Calc S1 FILTER JMLT21AA TH-228 6.95E-02 R 1.32E-01 3.90E-01 103% S1 TH-230 PCI/SA R 7.35E-02 2.68E-01 103% Caic FILTER JMLT21AA 1.79E-01 (9.34E-02)R 7.35E-02 2.68E-01 TH-232 (5.01E-02) U4 PCI/SA 103% Calc S1 FILTER JMLT21AA 4.47E-02 PCI/SA R 8.95E-02 3.26E-01 93% S1 TH-228 3.27E-01 (1.39E-01) Calc FILTER JMLT61AA Calc S1 **FILTER** JMLT61AA TH-230 3.15E-01 (1.34E-01)PCI/SA R 8.63E-02 3.15E-01 93% S<sub>1</sub> TH-232 (5.86E-02) U4 PCI/SA R 8.63E-02 3.15E-01 93% Calc FILTER 0.00E+00 JMLT61AA Calc S1 **FILTER** JMLT71AA TH-228 1.01E-01 (8.88E-02) U4 PCI/SA R 1.16E-01 3.41E-01 100% R 6.43E-02 2.34E-01 100% Calc \$1 TH-230 (4.37E-02) U4 PCI/SA FILTER JMLT71AA 1.95E-02 R 6.43E-02 2.34E-01 100% S<sub>1</sub> **FILTER** TH-232 -1.95E-02 (4.37E-02) U4 PCI/SA Calc JMLT71AA (7.98E-02) U4 PCI/SA R 1.17E-01 3.71E-01 75% **FILTER** TH-228 5.04E-02 Calc S1 JMLT81AA Calc S1 FILTER JMLT81AA TH-230 9.71E-02 (9.12E-02) U4 PCI/SA R 1.13E-01 3.57E-01 75% (5.43E-02) U4 PCI/SA R 7.99E-02 2.91E-01 75% Calc S1 FILTER JMLT81AA TH-232 -2.43E-02 (1.37E-01) R 1.48E-01 4.37E-01 86% Calc TH-228 PCI/SA S1 **FILTER JMLVA1AA** 2.34E-01 R 8.25E-02 3.01E-01 PCI/SA 86% Calc \$1 FILTER TH-230 2.51E-01 (1.17E-01)JMLVA1AA S1 TH-232 PCI/SA R 8.25E-02 3.01E-01 86% Calc **FILTER** 1.50E-01 (9.14E-02)JMLVA1AA TH-228 (8.48E-02) U4 PCI/SA R 9.26E-02 3.38E-01 80% S1 FILTER JMLVW1AA 8.45E-02 Calc JMLVW1AA TH-230 2.45E-01 (1.27E-01)PCI/SA R 8.94E-02 3.26E-01 80% Calc S1 **FILTER** 80% Calc S1 FILTER JMLVW1AA TH-232 5.44E-02 (6.10E-02) U4 PCI/SA R 8 94E-02 3.26E-01 88% PCI/SA R 7.14E-02 2.60E-01 (1.01E-01)Calc S<sub>1</sub> FILTER JMLV31AA TH-228 2.17E-01 PCI/SA R 6.90E-02 2.51E-01 88% TH-230 1.47E-01 (8.74E-02) Calc **S1** FILTER JMLV31AA PCI/SA R 6.90E-02 2.51E-01 88% Calc S<sub>1</sub> **FILTER** JMLV31AA TH-232 1.26E-01 (7.64E-02)(6.37E-02) U4 PCI/SA R 1.48E-01 4.17E-01 87% S1 TH-228 -4.49E-02 Calc FILTER JMLV51AA

<sup>- (1</sup>s Uncertainities)

IDC - Instrument Detection Level in Conc Units MLcC- Method Decision Level in Conc Units

MDC - Minimum Detectable Concentration \*Std - Lc, MDC using StdDev for Set of Blanks

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Q - Qualifier, U is Less Than Lc = 1.645\*TPU All Results Displayed to Three Digits Reguardless of Significants Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:51 RADCALC v4.8.26 STL Richland

Batch Nbr: 7011219	Alpha Spec, Thiso by ALP , F	Results	1/19/2007 5:30:16 AM
	Summary Report		

1						-								
Status	s Meth	Matrix	Wrk Ord	Parameter	Sa Act	Uncert	Q	Units	A	v ILcC	IDC	QC	Yield	RYId
Calc	S1	FILTER	JMLV51AA	TH-230	3.47E-01	(1.28E-01)		PCI/SA	R	7.14E-02	2.60E-01		87%	
Calc	S1	FILTER	JMLV51AA	TH-232	0.00E+00	(4.85E-02)	U4	PCI/SA	R	7.14E-02	2.60E-01		87%	/
Calc	S1	FILTER	JMLV81AA	TH-228	0.00E+00	(8.77E-02)	U4	PCI/SA	R	1.29E-01	4.70E-01		55%	
Calc	S1	FILTER	JMLV81AA	TH-230	1.14E-01	(1.14E-01)	U4	PCI/SA	R	1.25E-01	4.54E-01		55%	••
Calc	S1	FILTER	JMLV81AA	TH-232	1.14E-01	(1.14E-01)	U4	PCI/SA	R	1.25E-01	4.54E-01		55%	
Calc	S1	FILTER	JMLV91AA	TH-228	8.07E-02	(6.09E-02)	U4	PCI/SA	R	6.64E-02	2.42E-01		90%	
Calc	S1	FILTER	JMLV91AA	TH-230	3.51E-01	(1.22E-01)		PCI/SA	R	6.41E-02	2.34E-01		90%	
Calc	S <b>1</b>	FILTER	JMLV91AA	TH-232	0.00E+00	(4.36E-02)	U4	PCI/SA	R	6.41E-02	2.34E-01		90%	
Calc	S1	FILTÉR	JMN8F1AA	TH-228	9.85E-03	(8.63E-03)	U4	PCI/SA	R	1.12E-02	3.31E-02	В	95%	
Calc	S1	FILTER	JMN8F1AA	TH-230	7.54E-03	(5.69E-03)	U4	PCI/SA	R	6.20E-03	2.26E-02	В	95%	
Calc	S1	FILTER	JMN8F1AA	TH-232	0.00E+00	(4.22E-03)	U4	PCI/SA	R	6.20E-03	2.26E-02	В	95%	

NO LCS train valused Plintenan 1.23.07

 () - (1s Uncertainities)
 IDC - Instrument Detection Level in Conc Units MLcC- Method Decision Level in Conc Units MDC - Minimum Detectable Concentration \*Std - Lc, MDC using StdDev for Set of Blanks

Page 2

Q - Qualifier, U is Less Than Lc = 1 645\*TPU All Results Displayed to Three Digits Reguardless of Significants Date/Time - mm/dd/yy hh/mm, 24hr Time RecCnt:65 RADCALC v4.8.26 STL Richland

1/18/2007	5:15:14 PM	Standard M	laterial F	ractions (Vials)
Vial	Prep: 1/17/06 to			er by SMIdentifier,ConstituentCode,SMFractionIdentifier
Vial Identifier	Constituent	Prep Activity/Concentration	Std Wt Used	Prep, Decayed To Date Prep by Std Decayed Activity/Concentration
	Parent Sta	ndard: TH22906A100 Re	ef: 10/4/2004	2.1430E+01 ± 7.070E-01 DPM/G
THTE0183	TH-229	1.0109E+01 <u>+</u> 3.335E-01 DPM	0.4718 g	11/28/2006 11/28/2006 Armstron 2.1426E+01 ± 7.069E-01 DPM/0
		1.0109E+001 ± 1.011E+001 (	1)	1.0109E+001 , 1.0109E+001

STL Richland, SMFractions v4.8.12

\*- Isotope is an Impurity

Page 1

Record Count: 1

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	Batch Nbr: 7	011219	na Mariana	e ven del li gagga - Marabh La Marabh Malabh Malabh An Ann		Alpha	Spe	ec, 7	Γhl:	so by AL			ated	Resul	ts	N. S. E. (Print)	1/1	19/2007 5:3	0:17 AI
Sq	Status Method	Matrix	Protocol	Equation Se	t V	Vrk Ord	Units/	Matrix	QC/E	Detailed B Sa/On Date	-		/t Sep1/	/Sep2 Date	QC/Trac	er Vial Mult/Ent	Yld Total/Anal	y Vol Final/0	Count Vo
1 5364	Caic S1 403.P-0812	FILTER	*STLE	AlpisoWoB			PCI/S		1	2/05/06 12:25	01/17/0	7 22:03			THTF	1 0937 Alq	1.00		
S	Cnt Date	Paramete	r Samp	le Cnt Bkgr	nd Cnt	Instr	Geom	Trc/A	v En	t Efficiency1	Efficiency 2	2 Ent	YId Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAd	dj Decay	Abn
0	01/17/07 17:5	3 TH-228	3 , 500.05	6	).1333	ALP113	ED	N Y	N	3.1726E-01 (9.518E-03)		N	95% 6%	N	Min Mitseudi shiresis - Su - sur - s	1.0000E+00 (0.000E+00)	4 5045E-01 12.689255	1.0440E+0	0
1	01/17/07 17:5	3 TH-229	618 <b>-</b> 500.05		).1333	ALP113	ED	Y Y	N	3.1726E-01 (9.518E-03)		N	100%	N		1.0000E+00 (0.000E+00)	4.5045E-01 12.689255	1.0000E+0	0
2	01/17/07 17:5	3 TH-230	8 , 500.05	0 2	.1333	ALP113	ED	N Y	N	3.1726E-01 (9.518E-03)		Ν	95% 6%	N		1.0000E+00 (0.000E+00)		1.0000E+0	0
3	01/17/07 17:5	3 TH-232	0 / 500.05	2 -	.1333	ALP113	ED	N Y	N	3.1726E-01 (9.518E-03)		N	95% 6%	N		1.0000E+00 (0.000E+00)		1 0000E+0	C
5	Sq Calc Date	Parameter	Avg	Sa Act	Q	Net	Cnt Rt	Dpm	Wol	3ik Dpm-E	lik Vo	ol Used		Yield,EnFc	t Chem Yi	d,EFctU IDC/ILcC	BikLcC/	MDC StdDvN	/IdC/LcC
	01/18/07	TH-228		3.9481E-06 0.083761)	U4	1.9995 (4.242)		6.616 (0.01				1.00 0.014142		95%		0.425022 0.159102			
	01/18/07	TH-229		2.212048 1.606037)		1.2328 (4.974		3.886		3.886028 ) (0.19538	-1	1.00 0.01 <b>41</b> 42		95%					
	01/18/07	TH-230		0.3025 <b>77</b> 0.111635)		1.5998 (5.744)		0.052 (0.01		0.052936 ) (0.01933	٥١	1.00 (0.014142)		95%		0.226856 0.0 <b>6221</b> 6			
	01/18/07	TH-232		0.037821 0.046433)	U4	-1.9997 (2.4492		-0.00				1.00 (0.014142)		95%		0.278367 0.087987			
Sq	Status Method	Matrix	Protocol	Equation Se	W	rk Ord	Units/N	fatrix	QC/B	B Sa/On Date	AnalysisD	ate/PptWt	Sep1/S	Sep2 Date	QC/Trace	r Vial Mult/EntY	ld Total/Analy	Vol Final/C	ount Vol
	Calc S1 03,P-0813	FILTER	'STLE	AlpisoWoBS J7A0902			PCI/S/		12	2/05/06 12:10	01/17/07	22:04	redelleteren		THTF0	1 938 Alq	1 00 S 0.082984 S		
Sq	Cnt Date	Parameter	r Sample	e Cnt Bkgrr	d Cnt	instr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	YId Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	Decay	Abn
0	01/17/07 17:54	TH-228	4 ^ 500.15	6 1	.0666	ALP114	ED	N Y	N	3.3167E-01 (9.950E-03)		N	44% 3%	N		1.0000E+00 (0.000E+00)		1 0440E+00	)
I	01/17/07 17:54	TH-229	295 <b>^</b> -		.0666	ALP114	ED	Y Y	N	3.3167E-01 (9.950E-03)		N	100%	N		1.0000E+00 (0.000E+00)		1 0000E+00	)
	01/17/07 17:54	TH-230	3 <u> </u>	0 1000	.0666	ALP114	ED	N Y		3.3167E-01 (9.950E-03)		N	44% 3%	N		1.0000E+00 (0.000E+00)		1.0000E+00	1
ţ	01/17/07 17:54	TH-232	0 500.15	0 , 1000	.0666	ALP114	ED	N Y	N	3.3167E-01 (9.950E-03)		N	44% 3%	И		1.0000E+00 (0.000E+00)		1.0000E+00	
	(1e Uncertainti					ME . TDI		,		Page	1					RecCi	nt:2 R	ADCALC v4	9.76

RecCnt:2

RADCALC v4.8.26

() - (1s Uncertaintities), Q - Qualifier, U Result is Less Than Lc = 1 645 \* TPU Page 1

IDC - instrument Detection Level in Conc Units. MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

STL Richtand

Page 1

	Batch Nor: 7	7011219				F	Alpha	a Spe	ec, T	hls	so by ALF	P , C	alcul	ated	Resul	ts		1/	19/2007	7 5:30:17
S	q Calc Date	Parameter	Avg	Sa A	ct	Q	Net	Cnt Rt	Dpm	₩o f	Bik Dpm-Bi	k Vo	ol Used		Yield,EnFo	t Chem Ylo	I,EFctU IDC/ILc	C BikLc0	MDC S	tdDvMdC/
	01/18/07	TH-228	R	0.07786		U4	1.9980		0.013		0.01374 (0.032267	) (0	1.00		44%		0.83883 0.31401			
	01/18/07	TH-229	R	9.63666 (0.8065			5.8882 (3.435		1.775 (0.11		1.775302 (0.116472	) (0	1.00 0.014142		44%					
	01/18/07	TH-230	R	0.22391 (0.1362		U4	5.9982 (3.604		0.041		0.04125 (0.025004	) (0	1.00 0.0 <b>14</b> 142.		44%		0.44771 0.12279			
	01/18/07	TH-232	R	0.00E00 (0.0834		U4	0.0000		0.00E (0.01		0.00E00 (0.015374	) (0	1.00 0.014142		44%		0.44771 0.12279			
Sq S	Status Method	Matrix	Protoco	ol Equati	on Set	Wrl	k Ord	Units/	latrix	QC/B	B Sa/On Date	AnalysisD	ate/PptWi	Sep1	/Sep2 Date	QC/Trace	r Vial Mult/Ent	/ld Total/Ana	ly Vol F	inal/Count
	Calc S1 03,P-0814	FILTER	*STLE	Alpiso\	WoBS .			PCI/S		12	2/05/06 12:45	01/17/07	22:04			THTF09	1 39 Alq	1.00 0.081149		
Sq	Cnt Date	Parameter	Sam	ple Cnt	Bkgrnd C	Cnt	instr	Geom	Trc/Av	Ent	t Efficiency1	Efficiency 2	Ent	YId Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolA	dj Decay	, ,
) (	01/17/07 17:5	64 TH-228	5 500.0	0833333	3 1000.05		LP116	ED	N Y	N	2.6199E-01 (7.860E-03)		N	83% 5%	Ν		1.0000E+00 (0.000E+00)	4.5045E-01 12.323053	1.0440	E+00
. (	01/17/07 17.5	4 TH-229	445 500.0	. <b>₹</b> 0833333	2 /		LP116	ED	Y Y	N	2.6199E-01 (7.860E-03)		N	100%	N		1.0000E+00 (0.000E+00)	4.5045 <b>E</b> -01 12.323053	1.0000	E+00
(	01/1 <b>7</b> /07 17:5	4 TH-230	3 <i>1</i> 500.0	, 08 <b>35</b> 333	1 /		LP116	ED	N Y	N	2.6199E-01 (7.860E-03)		N	83% 5%	Ν		1.0000E+00 (0.000E+00)	4.5045E-01 12.323053	1.0000	E+00
(	01/17/07 17:5	4 TH-232	0 <i>/</i> 500.0	0833333	1 -		LP116	ED	N Y		2.6199E-01 (7.860E-03)		N	83% 5%	N		1.0000E+00 (0.000E+00)		1.0000	E+00
Sq	Calc Date	Parameter	Avg	Sa Ac	:t	Q	Net C	nt Rt	Dpm	Wo B	lik Dpm-Bik	vol	Used		Yield,EnFct	Chem Yld,	EFctU IDC/ILc0	BlkLcC	MDC St	dDvMdC/L
	01/18/07	TH-228	R	0.18575 (0.12833		U4	6.9984		0.032		0.032054 (0.022083)	(0	1.00		83%		0.446124 0.151234			
	01/18/07	TH-229	R	18.8116 (1.44002			8.8785 (4.2207		3.388		3.38893 (0.190501)	(0	1.00 (014142.		83%					
	01/18/07	TH-230	R	0.12709		U4	4.9990		0.022		0.022897 (0.01 <b>6</b> 593)	(0	1.00 (014142.		83%		0.304951 0.083637			
	01/18/07	TH-232	R	-0.02542 (0.05688		U4	-9.9995 (2.2357		-0.004 (0.010		-0.0045 <b>8</b> (0.010245)	(0.	1.00 (014142.	Sa	83%		0.304951 0.083637			
S	tatus Method	Matrix 1	rotoco	I Equation	on Set	Wrk	Ord	Units/M	atrix (	C/BE	Sa/On Date	AnalysisDa	te/PptWt	Sep1/s	Sep2 Date	QC/Tracer	Vial Mult/EntY	ld Total/Anal	y Vol Fir	nal/Count
	alc S1 3,P-0815	FILTER	'STLE	AlpisoV J7A	VoBS <b>J</b> 090287-4			PCI/SA		12	/05/06 12:30	01/17/07	22:04			THTF094	1 40 Alq	1.00 s 0.080394 s		
Sq	Cnt Date	Parameter	Sam	ple Cnt I	Bkgrnd Ci	nt I	nstr	Geom	Trc/Av	Ent	Efficiency1	Efficiency 2	Ent	Yld Fct	Ent l	3lk Value	Ingr Fct	Conv Fct/VolAc	ij Decay	Ai
0	1/17/07 17:54	4 TH-228	5		2 / 2500.05		LP117	ÉD	N Y		3.3025E-01 (9.908E-03)		N	100% 6%	N		1.0000E+00 (0.000E+00)		1.0440	E+00
C -	Instrument Dete	ies), Q - Qualifie ection Level in C rived from the Co	one Unit	ts, MLcC -	Method D	Decisio	n L <b>eve</b> l ir				Page 2 nimum Detectable	Concentration	n		W#1844 .p. 1 1	ga i ku managalangan yang bis mel si basa a ka	RecC		RADCALO	C v4.8.26

Batch Nbr: 70	11219			1	Alpha	Spe	c, T	hls	so by ALP	, Ca	lcula	ated	Result	S		1.	/19/2007 5:30	D:17 A
1 01/17/07 17:54	TH-229	671 <sub>_</sub> 500	2 2500.05		ALP117 I	ED	Y Y	Ν	3.3025E-01 (9.908E-03)		N	100%	N		1.0000E+00 (0.000E+00)	4.5045 <b>E-</b> 01 12.438814	1.0000E+00	0
2 01/17/07 17:54	TH-230	3 500	2500.05		ALP117 I	ED	N Y	Ν	3.3025E-01 (9.908E-03)		N	100% 6%	N		1.0000E+00 (0.000E+00)	4.5045E-01 12.438814	1.0000E+00	0
3 01/17/07 17:54	TH-232	500	2 <b>/</b> 2500.05		ALP117 (	ED	N Y	N	3.3025E-01 (9.908E-03)		N	100% 6%	Ν		1.0000E+00 (0.000E+00)		1.0000E+00	)
Sq Calc Date	Parameter	Avg	Sa Act	Q	Net Cr	nt Rt	Dpm	Wo I	Bik Dpm-Bik	Vol	Jsed		Yield,EnFct	Chem Ylo	i,EFctU IDC/ILc0	BikLc	C/MDC StdDvM	ldC/LcC
01/18/07	TH-228	R 0.	.1636 ).081333)		9.20002 (4.5078E		0.0279		0.027968 (0.013828)	(0.0	1.00 (14142)		100%		0.200975 0.052328			
01/18/07	TH-229		2.754903 .623793)		1.34120 (5.1810E		4.061 (0.198		4.06 <b>1</b> 154 (0.198634)	(0.0	1.00 ( <b>1414</b> 2)		100%					
01/18/07	TH-230		.0953 <b>87</b> ).059937)	U4	5.600011 (3.48718		0.0170		0.017024 (0.010661)	(0.0)	1.00 (14142)		100%		0.163163 0.035442			
01/18/07	TH-232		.02044 ).035445)	U4	1.200021 (2.0785E		0.0036		0.003648 (0.006323)	(0.0	1.00 (14142)		100%		0.192507 0.050123			
Sq Status Method	Matrix P	rotocol	Equation Set	Wrl	k Ord	Units/M	latrix C	C/B	B Sa/On Date	AnalysisDat	e/PptWt	Sep1/s	Sep2 Date	QC/Trace	r Vial Mult/EntY	id Total/Ana	ily Vol Final/Co	ount Vo
5 Calc S1 F	ILTER '	STLE A	AlpisoWoBS , J7A090287-			PCI/SA	١	12	2/05/06 12:50	01/17/07 2	22:04			THTF09	1 941 Alq	1.00 0.083453		
Sq Cnt Date	Parameter	Sample	Cnt Bkgrnd C	nt	instr	Geom	Trc/Av	Ent	t Efficiency† E	fficiency 2	Ent	Yld Fct	Ent 8	3lk Value	Ingr Fct	Conv Fct/VolA	dj Decay	Abn
01/17/07 17:54	TH-228	500.183	4 A 33333 2500.01		LP118 E	ĒD	N Y		3.5075E-01 (1.052E-02)		N	89% 5%	N	Aprile - Note o	1.0000E+00 (0.000E+00)		1.0440E+00	, ,,,,,
01/17/07 17:54	TH-229	641 ×	9 / 33333 2500.01		LP118 E	Đ	Y Y		3.5075E-01 (1.052E-02)		N	100%	N		1.0000E+00 (0.000E+00)		1.0000E+00	
01/17/07 17:54	TH-230	11 /	2 / 33333 2500.01	Α	LP118 E	D	N Y		3.5075E-01 (1.052E-02)		N	89% 5%	N		1.0000E+00 (0.000E+00)		1.0000E+00	
01/17/07 17:54	TH-232	1 ′	1 33333 2500.01	Α	LP118 E	D	N Y		3.5075E-01 (1.052E-02)		N	89% 5%	Ν		1.0000E+00 (0.000E+00)		1.0000E+00	
Sq Calc Date	Parameter		Sa Act	Q	Net Cn	t Rt	Dpm \	No B	lik Dpm-Bik	Vol U	sed	,	Yield,EnFct	Chem Yld	EFctU IDC/ILcC	BlkLcC	MDC StdDvMc	dC/LcC
01/18/07	TH-228		115131 .074033)	-	6.39708E		0.0204		0.020431 (0.013095)	(0.0)	1.00 14142)		89%		0.247188 0.074883			
01/18/07	TH-229		9.665672 ,41398)		1.27793E (5.0632E		3.6433 (0.181)		3.643379 (0.181063)	(0.0	1.00 (14142	Sa	89%					
01/18/07	TH-230		365335 .118817)		2.11919E (6.6549E		0.0676		0.067684 (0.02173)	(0.0)	1.00 14142)	Sa	89%		0.194783 0.05072			
01/18/07	TH-232	R 0.	02757 .035226)	U4	1.59927E (2.0389E		0.0051 (0.006		0.005108 (0.006521)	(0.0)	1.00 (14142	Sa	89%		0.16509 0.035865			
) - (1s Uncertainities	s), Q - Qualifier	U Result	is Less Than Lc	= 1.64	5 * TPU				Page 3						RecCi	nt:6	RADCALC v4.8	8.26

0:19 A	9/2007 5:30	1/1			ılts	Resul	ated	alcul	, C	by ALF	1 S	c, ir	Spe	Alpha				011219	tch Nbr: 70	E
Count \	/ Vol Final/C	1 Total/Anal	Mult/EntY	2C/Tracer V	e	/Sep2 Date	t Sep1	ate/PptW	AnalysisD	Sa/On Date	C/BB	atrix Q	Units/M	rk Ord	Set \	Equation 9	Protocol	Matrix I	atus Method	q S
		1.00 \$	1	THTF0952				09:42	01/18/07	05/06 12:25	12/	В	PCI/SA FILTER	I8F1AA	BS JMI 0000-219	AlpisoWol	*STLE		IC S1 A-LAB BLANK	
Ab	lj Decay	onv Fct/VolAc	gr Fct	Value	В	Ent	Yld Fct	Ent	Efficiency 2	Efficiency1	Ent	Trc/Av	Geom	Instr	grnd Cnt	e Cnt Bkg	Sampl	Parameter	Cnt Date	Sq
0	1.0445E+00		000E+00 000E+00)			N	95% 6%	N		.5259E-01 7.578E-03)		N Y	ED	ALP119		3	4 500.03		/18/07 05:32	) (
D	1.0000E+00		000E+00 000E+00)			N	100%	N		.5259E-01 7.578E-03)		Y Y	ED	ALP119	,	1 33333 100	485 / 500.03	TH-229	/18/07 05:32	(
٥	1.0000E+00		000E+00 000E+00)			N	95% 6%	Ν		.5259E-01 7.578E-03)		N Y	ED	ALP119	,	0 33333 100	ىر 2 500.03	TH-230	/18/07 05:32	(
٥	1.0000E+00		000E+00 00E+00)			N	95% 6%	N		.5259 <b>E</b> -01 7.578 <b>E-</b> 03)		N Y	ED	ALP119	,	0 33333 100	0 500.03	TH-232	/18/07 05:32	(
/dC/Lc	IDC StdDvM	BlkLcC/f	J IDC/ILcC	hem Yld,EF	ct	Yleid,EnFo		Used	c Vol	Dpm-Bil	o Blk	Dpm V	Cnt Rt	Net (	Q	Sa Act	Avg	Parameter	Calc Date	Sq
			0.033101 0.01122			95%		1.00	) (0	0.020931 (0.018303		0.0209		5.0004 (4.358		.009848 0.008627)		TH-228	01/19/07	
						95%		1.00 (017321.	(0	3.836016 (0.208955)		3. <b>836</b> 0 (0.2089		9.6893 (4.405		.727934 ).131223)		TH-229	01/19/07	
			0.022616 0.006202			95%		1.00 (017321.	(0	0.016742 (0.012612)	_	0.01674 (0.0126		3.9997 (2.9997	U	.007542 ).005695)	_	TH-230	01/19/07	
			0.022616 0.006202			95%		1.00 (017321	(0	0.00E00 (0.009359)	-	0.00 <b>E</b> 0 (0.0093		0.0000	_	.00E00 .004216)	-	TH-232	01/19/07	
ount V	Vol Final/Co	Total/Analy	Mult/EntYle	C/Tracer Vi		Sep2 Date	Sep1/	te/PptWt	AnalysisDa	Sa/On Date	C/BB	trix Q	Units/Ma	rk Ord	et V	Equation S	rotocol	Matrix P	tus Method	q S
		1.00 S 1.00 S	1	THTE0183 THTE0183				09:42	01/18/07	5/06 12:25	12/0	S	PCI/SA FILTER	8F1AC	0000-219	AlpisoWoB J7A11,	STLE /	FILTER .	S1 F	7 E
Abr	Decay	onv Fct/VolAdj	rfet C	Value	ві	Ent	Yld Fct	Ent	Efficiency 2	Efficiency1	Ent	Γrc/Aν	Geom	Instr	rn <b>d</b> Cnt	Cnt Bkg	Sample	Parameter	Cnt Date	Sq
1	1.0000E+00	.5045 <b>E</b> -01 .00	00E+00 00E+00)			N	100%	N		3685 <b>E</b> -01 .106E-03)		Y Y	ED	ALP120	0.2666		1045 / 500.2	TH-229	/18/07 05:32	0
		.00				Ν		N			N	N I	ED	ALP120	0.2666	0 - 100	5 500.2	TH-230	/18/07 05:32	0
dC/Lc(	DC StdDvMd	BlkLcC/M	IDC/ILcC	nem Yld,EFo	ct (	Yield,EnFc		Used	Vol	Dpm-Blk	o Bik	Dpm W	nt Rt	Net C	Q	Sa Act		Parameter	Calc Date	Sq
						87%		1.00	(0.	8.795127 (0.379705)		8.79512 (0.3797		2.0831		961765 .270558)		TH-229	01/19/07	

<sup>() - (1</sup>s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 \*TPU Page 10
IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration
Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt.17 RADCALC v4.8.26

STL Richland

# THORIUM ISOTOPIC COUNTING REQUEST

	1/18
$\mathbf{r}$	10.0

.R. Technician	of
nate Counted	1/17/07

Counting Time 500 \_Minutes Sample \_\_\_

50P's Operating:

RICHRD008

C.R. Analyst \_\_\_\_\_\_\_ Date Analyzed

Background See Alpha Analysis Report

Review:

RICHRD0016 7011219

		Th-229 (4 Tra	-							
	f	rom Th-234 (	Beta Count (	(7)	Th-228 (5423 KeV)	Th-230 (4688 KeV)	Th-232 (4010 KeV)			
WorkOrder #	ID	Activity	ROI Cts	BKG	(6)	(8)	(9)	Det #	Comment	
JMK811AA V		10		, O.	See Alpha A	113				
JMLA 11 AA		10		0	See Alpha A	Analysis Report for ROI	Information	114		
JMLA HIAA V		10		0	See Alpha A	inalysis Report for ROI	Information	116		
JMLA71AAV		10		0	See Alpha A	inalysis Report for ROI	Information	117		
TMLA81AA /		10		o	See Alpha A	nalysis Report for ROI	Information	118		
JMLT21AA		10		Ö	See Alpha A	nalysis Report for ROI 1	Information	119		
JMLT61AA		10		0	See Alpha A	nalysis Report for ROI 1	information	120		
		10		0	See Alpha A	nalysis Report for ROI I	nformation			
		10		0	See Alpha A	nalysis Report for ROI I	nformation			

Comments:

Approved by:

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Ξ.	TRENT		ı	لسلا

RICHLAND

# THORIUM ISOTOPIC COUNTING REQUEST

0.0		OKTOM TOO	TOTE OCCUPATE
C.R. Technician	Countin	ng Time	SOP's
Date Counted 1/1867	Sample	500	Minutes Operating

RICHRD008

C.R. Analyst	Background See Alpha Anal
Date Analyzed	13RC

Review: RICHRD0016

ysis Report 7011219

		Th-229 (4 Tra								
	fı	om Th-234 i	Beta Count (	(7)	Th-228 (5423 KeV)	Th-230 (4688 KeV)	Th-232 (4010 KeV)			
WorkOrder #	ID Activit		ROI Cts BKG		(6)	(8)	(9)	Det #	Comment	
JMN8FIAA ~		10		0	See Alpha	Analysis Report for ROI	Information	119		
JMN8FIAA -		10		0	See Alpha A	Analysis Report for ROI	Information	/20		
		10		0	See Alpha A	Analysis Report for ROI	Information			
		10		(0	See Alpha A	Inalysis Report for ROI	Information			
		10		0	See Alpha A	inalysis Report for ROI	Information			
		10			See Alpha A	inalysis Report for ROI I	Enformation		-	
		10		0	See Alpha A	nalysis Report for ROI 1	Information			
		10		, O	See Alpha A	nalysis Report for ROI I	Information			
		10		O	See Alpha A	nalysis Report for ROI I	information			

Approved by:\_ Date:\_\_\_

# THORIUM STANDARDS AND TRACEABILITY

STL RICHLAND

#### Th22906A

Th22906A100 Ref. 6102 21.43 ± 0.707 dpm/g 6/8/2006 DVF

STL RICHLAND

#### **Th-229 Verification Check**

6/8/2006 tda

Source

Th22906A100 #6102

Source

Th23006A100 #6096

Calculation for Th229 Radiochemical Yield (Th229 cpm \* d/c) / (Th229 dpm expected \* Tracer Yield) =

			Th229		
	Th229		dpm	Tracer	RCHEM
	cpm	d/c	expected	Yield_	Yield
DVF2638	6.72	3.438	21.769	1.053	1.00766
DVF2639	6.744	3.339	21.73	1.036	0.999814
DVF2640	5.597	3.941	21.739	1.062	0.955033
DVF2641	5.839	4.03	21.779	1.088	0.993415
				Avg.	0.989
				Std. Dev.	0.02

Calculation for Th230Tracer Yield (Th230 cpm) (d/c) / Th230 dpm expected) =

	Th230		Th230	Tracer
	cpm	d/c	dpm exp.	Yield
DVF2638	6.755	3.438	22.05	1.053
DVF2639	6.839	3.339	22.032	1.036
DVF2640	5.953	3.941	22.082	1.062
DVF2641	5.936	4.03	21.995	1.088
			Avg.	1.060
			Std. Dev.	0.02

The original NIST Cerificate is located in Document Control Dept.

SEVERN	CTI	
TRENT	JIL	

# **COUNTING REQUEST**

		count time:  count time:  count time:  count time:  000	Geom.:		units: units: units: units: dpm/Sa
Requested by:	<u>.                                      </u>	Date submitted:	6/6/6	· .	
	Sample ID	Isotopes of intel  14229 06A Loc		Sample Date	
171	2639	11/10/00/10			-
172	2640				
					-
175	2642	M29021	+120		-
174	2643				
178	2645				
ADDITIONAL INSTRUC	TIONS:	EN	x 11.22	906 A100	A LION
1 1000			1 230	06A 10	2 \$ 6096
		· · · · · · · · · · · · · · · · · · ·	* Th	229071	A 1/2 H518
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IS	SEVERN	CTI	-
Ľ	TRENT	211	_

THORIUM ISOTOPIC COUNTING

Minutes

$\underline{G}$	KE	Ql	JES	T
_				

ਲ H C.R. Technician	1 A ( /
Date Counted	6/7/06

Counting Time 1000 Sample \_\_\_

SOPs Operating:

RICHRD008

Date Analyzed 4/1/4

Background <u>See Alpha Analysis Report</u>

6/6/2006

RICHRD0016 TO 60094

		Th-229 ( Tro	4845 KeV) Icer			TOTAL COUNTS			
	1	from Th-234 Beta Count (7)			Th-228 (5423 KeV)	Th-228 (5423 KeV) Th-230 (4688 KeV) Th-232 (4010 KeV)			
WorkOrder #	ID	Activity	ROI Cts	BKG	(6)	(8)	(9)	Det #	Comment
DVF-2638		10		0	See Alpha A	Analysis Report for ROI	Information	17/	3.438
DVF 2639		10		0	See Alpha A	Analysis Report for ROI	Information	172	3, 339
DV-2640		10		0	See Alpha A	Analysis Report for ROI	Information	173	3, 941
DVF 2641		10		0	See Alpha A	Analysis Report for ROI	Information	174	4.03
DVF 2642		10		0	See Alpha A	Analysis Report for ROI	Information	175	3.405
DVF 2643		10		0	See Alpha A	Analysis Report for ROI	Information	176	3 - 43
DVF 2644		10		0	See Alpha A	Analysis Report for ROI :	Enformation	177	3, 877
DVF 2645		10		0	See Alpha A	analysis Report for ROI 1	Enformation	178	3.191
		10		0	See Alpha A	inalysis Report for ROI 1	Enformation		

 $\begin{array}{c} \begin{array}{c} 1 \\ 6 \\ 9 \end{array} \text{ Form No:} \underline{\text{RC-012, 10/02, Rev 9}} \end{array}$ 

Approved by:

Constitue	nt Prep Activity	Concentration		Std Wt U	sed	Prep,Deca	yed To Date	Prep by Std Decaye	d Activity/Cond	entration
Parent 9	standard: TH229	06A100	Ref.	10/4/2004		2.1430E+	01 ± 7.070	DE-01 DPM/G		
TH-229	2.1769E+01	± 7.182E-01	DPM	1.0158	g	6/6/2006	6/6/2006	Armstron 2.1430E+01	± 7.070E-01	DPM/G
TH-229	2.1730E+01	± 7.169E-01	DPM	1.014	9	6/6/2006	6/6/2006	Armstron 2.1430E+01	± 7.070E-01	DPM/G
TH-229	2.1739E+01	± 7.172E-01	DPM	1.()144	g	6/6/2006	6/6/2006	Armstron 2.1430E+01	± 7.070E-01	DPM/G
TH-229	2.1779E+01	± 7.185E-01	DPM	1.0163	9	6/6/2006	6/6/2006	Armstron 2.1430E+01	±7.070E-01	DPM/G
	Parent S TH-229 TH-229 TH-229	Parent Standard: TH229 TH-229 2.1769E+01 TH-229 2.1730E+01 TH-229 2.1739E+01	Parent Standard: TH22906A100  TH-229	TH-229 2.1769E+01 ± 7.182E-01 DPM TH-229 2.1730E+01 ± 7.169E-01 DPM TH-229 2.1739E+01 ± 7.172E-01 DPM	Parent Standard: TH22906A100 Ref: 10/4/2004 TH-229 2.1769E+01 ± 7.182E-01 DPM 1.0158 TH-229 2.1730E+01 ± 7.169E-01 DPM 1.014 TH-229 2.1739E+01 ± 7.172E-01 DPM 1.0144	Parent Standard: TH22906A100 Ref: 10/4/2004  TH-229 2.1769E+01 ± 7.182E-01 DPM 1.0158 g  TH-229 2.1730E+01 ± 7.169E-01 DPM 1.014 g  TH-229 2.1739E+01 ± 7.172E-01 DPM 1.0144 g	Parent Standard: TH22906A100 Ref. 10/4/2004 2.1430E+ TH-229 2.1769E+01 ± 7.182E-01 DPM 1.0158 g 6/6/2006 TH-229 2.1730E+01 ± 7.169E-01 DPM 1.014 g 6/6/2006 TH-229 2.1739E+01 ± 7.172E-01 DPM 1.0144 g 6/6/2006	Parent Standard: TH22906A100 Ref. 10/4/2004 2.1430E+01 ± 7.070 TH-229 2.1769E+01 ± 7.182E-01 DPM 1.0158 g 6/6/2006 6/6/2006 TH-229 2.1730E+01 ± 7.169E-01 DPM 1.014 g 6/6/2006 6/6/2006 TH-229 2.1739E+01 ± 7.172E-01 DPM 1.0144 g 6/6/2006 6/6/2006	Parent Standard: TH22906A100 Ref: 10/4/2004 2.1430E+01 ± 7.070E-01 DPM/G  TH-229 2.1769E+01 ± 7.182E-01 DPM 1.0158 g 6/6/2006 6/6/2006 Armstron 2.1430E+01  TH-229 2.1730E+01 ± 7.169E-01 DPM 1.014 g 6/6/2006 6/6/2006 Armstron 2.1430E+01  TH-229 2.1739E+01 ± 7.172E-01 DPM 1.0144 g 6/6/2006 6/6/2006 Armstron 2.1430E+01	Parent Standard: TH22906A100 Ref: 10/4/2004 2.1430E+01 ± 7.070E-01 DPM/G  TH-229 2.1769E+01 ± 7.182E-01 DPM 1.0158 g 6/6/2006 6/6/2006 Armstron 2.1430E+01 ± 7.070E-01  TH-229 2.1730E+01 ± 7.169E-01 DPM 1.014 g 6/6/2006 6/6/2006 Armstron 2.1430E+01 ± 7.070E-01  TH-229 2.1739E+01 ± 7.172E-01 DPM 1.0144 g 6/6/2006 6/6/2006 Armstron 2.1430E+01 ± 7.070E-01

 $2.1754E+001 \pm 2.356E-002$  ( 4) 0.108% 2.1730E+001 , 2.1779E+001

STL Richland, SMFractions v4.8.12

\*- Isotope is an impurity

Page 2

Record Count: 9

## TH22906A.XLW

## ISOTOPE DILUTION RECORD

1) Prepared by tda	2) Date Prepared		10/8/2004			
3) Source Identification Number / Ref. Number	TH22906A100		6102			
4) Source Activity (dpm ± dpm/g)	2.1430E+03	±	7.070E-01			
5) Percent error of Source Activity	3.3	%				
6) Weight of Source Material used (g)	1					
7) 1% Error) of Weight of Source Material used	0.4800	%				
8) Diluent	0.5 M HNO3					
9) Total Weight of the Dilution (g)	100					
10) (% Error) of Total Weight of the Dilution	0.3000	%				
11) Specific Activity of Diluted Solution dpm/g	2.1430E+01	±	7.175E-01			
12) Total Uncertainty	3.348	%				
13) Dilution Identification Number / Ref. Number	TH22906A100		6102			
14) Calibration Reference Date	11/12/2003					
15) Isotope Inventory File update by/date	tda					
16) Reviewed by/date			Maria de la companya			
17) Location QCLAB	18) Exhausted					
*****************************						
CALCULATIONS						
7) % Frror of Wt. used = (0.0048 / Weight of Source Material used * 100)						
10) % error of Dilution Wt. = (0.3 / Total Weight of Dilution * 100)						
11) Specific Activity = Source Activity * Wt. of Source Material used / Total Wt. of the Dilution						
12) % Total Uncertainty = (% error of Source Activity ^2 + % error of Wt Used^2 + % error of Dilution Wt.^2)						

Form CC-006, 7/15/99, Rev 3

## THORIUM CONTINUING CALIBRATION

234

Quality Assurance Report Generated 7-FEB-2007 08:46 35.28 QA Filename RDND06::RDND06\$DKA100:j \( LP113.QA \) GROUP 1 CHK.QAF, I - Multi Test Full Report --Description : Efficiency, Pu-239 Parameter Units: : % Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 0.3299 | | | 21 IAN-2007 09:01 chk Multi-Test Full Report --Description : Constant FWHM Parameter Units : channels Parameter Type : Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 5.8333 21-JAN-2007 09:01 chk -- Multi-Test Full Report --Description : Centroid, Pu-239 Parameter Units : channels Parameter Type : Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 312.5523 21-JAN-2007 09:01 chk - Multi-Test Full Report --Description : Average Efficiency Parameter Units: % Parameter Type: Measurement Time Sample ID Sample Analyst Value LU[SD[UD]BS Rej 

0.3441

257

21-JAN-2007-09.01\_chk

-- Multi-Test Full Report --

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Description : Energy Calibration Slope
Parameter Units keV/chan Parameter Type:
Measurement Time Sample ID Sample Admyst Value 1 USDIUDIBS Rej
 and a second control of the control 
21-JAN-2007 09.01 cbk 7-6019. 1. [
-- Multi-Lest Full Report --
Description : Efficiency, Am-241
Parameter Units 1% Parameter Type 1
 Measur ament Time Sample ID Sample Analyst Value LU[SD]UD[BS Rej
   11 JAN 2007 09:01 chk
                                                                                                                                                      0.3299
   - Mula Test Full Report --
 Description . Centroid, Am-241
 Parameter Units : channels
                                                                                                                  Parameter Type:
  Measurement Time Sample ID Sample Analyst Value LU[SD[UD]BS Rep
   Quality Assurance Multi-Test Full Report (continued)
                                                                                                                                                                                                             Page: 2
  Measurement Time Sample ID Sample Analyst Value LU[SD[UD]BS Rej
   21-1AN-2007-09:01_chk =
                                                                                                                                                       356.5967
 Quality Assurance Report. Generated 7-FBB-2007 08:46.36.40
  QA Eilename :: RDND06. RDND06$DKA100:[ALP113.QA]GROUP 1 BKG QAF 1
          Muni Test Full Report -
   Description 4010, Th-252 bkg tentsmin).
    Parameter Units - ents/min - Parameter Type :
    Measurement Time Sample ID Sample Analyst Value I U|SD|UD|BS Rej
      and the control of th
                                                                                                                                        0.0000 ( )
    22-JAN-2007 06:25 bkg
```

18 . . .

-- Multi-Test Full Report --Description : 4196, U-238 bkg (ents/min) Parameter Units | cnts/min | Parameter Type : Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0000 | | | -- Multi-Test Full Report --Description : 4396, U-235 bkg (ents/min) Parameter Units : cnts/min Parameter Type Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 0.0000 22-JAN-2007 06:25 bkg -- Multi-Test Full Report --Description : 4688, Th-230 bkg (cnts/min) Parameter Type: Parameter Units : ents/min Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0000 -- Multi-Test Full Report --Description : 4776, U-234 bkg (cnts/min) Parameter Units: ents/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU[SD]UD[BS Rej 0.0000 - 1.122-JAN-2007 06:25 bkg -- Multi-Test Full Report --Description (4788, Np-237 bkg (cnts/min) Parameter Units | cnts/min | Parameter Type Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej file:///P//Transfer/qa1 alp113 7-feb-2007-08463865.txt

file:///P|/Transfer/qa1\_alp113\_7-feb-2007-08463865.txt -- Multi-Test Full Report --Description : 5275, Am-243 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Γime Sample ID Sample Analyst Value LU|SD|UD|BS Rei 22-JAN-2007 06:25 bkg 0.0000 + ++-- Multi-Test Full Report --Description : 5305, Po-210 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej  $0.0000 \mid \cdot \mid \cdot \mid$ 22-JAN-2007 06:25 bkg -- Multi-Test Full Report --Description : 5320, U-232 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0000 + 1 + 1-- Multi-Test Full Report --: 5423, Th-228 bkg (cnts/min) Parameter Type: Parameter Units : cnts/min Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej Quality Assurance Multi-Test Full Report (continued) Page: 3 Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0000 + 11-- Multi-Test Full Report --Description : 5486, Am-241 bkg (cnts/min)

file:///P]/Transfer/qa1\_aip113\_7-fcb-2007-08463865 ixt Parameter Units : cnts/min Parameter Type : Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0000 -- Multi-Test Full Report --Description : 5499, Pu-238 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 0.0000 22-JAN-2007 06:25 bkg -- Multi-Test Full Report --Description : 5770, Pu-236 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0050 -- Multi-Test Full Report --Description : 5805, Cm-244 bkg (cnts/min) Parameter Units : cnts/min Parameter Type : Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 0.0060 | | | 22-JAN-2007 06:25 bkg -- Multi-Test Full Report --Description : 6113, Cm-242 bkg (cnts/min) Parameter Units : cnts/min Parameter Type : Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0000 + 1

Ouality Assurance Report. Generated 7-FEB-2007 08:54:13.35 -- Multi-Test Full Report --Description : Efficiency, Pu-239 Parameter Units: Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 0.4256 21-JAN-2007 09:01 chk - Multi-Test Full Report --Constant FWHM Description Parameter Units channels Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 6.8333 | | | 21-JAN-2007 09:01 chk --- Multi-Test Full Report --Description : Centroid, Pu-239 Parameter Units : channels Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej -----303 2285 21-JAN-2007 09:01 chk -- Multi-Test Full Report --Description : Average Efficiency Parameter Units . Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 0.3379 21-JAN-2007 09:01 chk -- Multi-Test Full Report --

Description Efficiency, Am-241 Parameter Units % Parameter Type: Measurement Unite Sample ID Sample Analyst Value LU(SD)UD(BS Re) THE TELEFORM THE SECOND THE STANDS FOR MANAGEMENT OF THE SECOND FREE TO SECOND FOR THE SECOND 0.4256 21-JAN 2007 09:01 chk - Malta Test Pull Report -Description : Centroid, Am-241 Parameter Units : channels Parameter Type Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 21-JAN-2007 09:01 chk 348.9291 Quality Assurance Report. Generated 7-FEB-2007 08:54.14.38 QA Filename : RDND06::RDND06\$DKA100:[ALP114.QA]GROUP | BKG.QAF;1 -- Multi-Pest Full Report --Description : 4010, Th-232 bkg (cnts/min) Parameter Units : ents/min Parameter Type · Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 0.0000 22-JAN-2007 06:25 bkg Multi-Test Full Report — Description : 4196, U-238 bkg (ents/min) Parameter Umits . cnts/min Parameter Type Measurement Time Sample ID Sample Analyst Value LUISD[UD]BS Rej тень история станения такжим интернационня выборовать выправления в вышения в подаворовать на вестем в выполнения в подаворовать на вестем в выполнения в подаворовать выполнения в подаворовать в подаво 22-JAN-2007 06:25 bkg 0.0000 Multi-Test Infl Report

re · ·

Description 4396, U-235 bkg (ents/min)

Parameter Units : cnts/min Parameter Type :

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 0.0020 | | | 22-JAN-2007 06:25 bkg -- Multi-Test Full Report --Description : 5320, U-232 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 0.0020 | | | 22-JAN-2007 06:25 bkg -- Multi-Test Full Report --Description : 5423, Th-228 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej Quality Assurance Multi-Test Full Report (continued) Page: 3 Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0030 | | | -- Multi-Test Full Report --Description : 5486, Am-241 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0040 | | | -- Multi-Test Full Report --Description : 5499, Pu-238 bkg (cnts/min) Parameter Units: cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

Parameter Type:

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

0.0010 | | |

11 1 1 1

Parameter Units : cnts/min

22-JAN-2007 06:25 bkg

Quality Assurance Report. Generated 7-FEB-2007 08:54:37.49 QA Filename : RDND06::RDND06\$DKA100:[ALP116.QA]GROUP | CHK QAF;2 -- Multi-Test Full Report --: U-238 Centroid Description Parameter Units: channel Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 179.7862 21-JAN-2007 09:01 chk -- Multi-Test Full Report --: Constant FWHM Description Parameter Units: channels Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 8.6667 | | | 21-JAN-2007 09:01 chk -- Multi-Test Full Report --Description : Cf-252 Centroid Parameter Units : channels Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 435.9836 21-JAN-2007 09:01 chk Multi-Test Full Report ---Description : Average Efficiency Parameter Units : counts/decay Parameter Type : Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 21-JAN-2007 09:01 chk -0.1720 + 11-- Multi-Test Full Report --

file://Pl/Transfer/gal\_alp116\_7-fcb\_2007-08544095\_txt

rs . . . .

file:///P//Transfer/qa1\_alp116\_7-feb-2007-08544095.axt Parameter Units \_\_ents/min Parameter Type : Measurement Time Sample ID Sample Analyst Value 10.80/00/BS Rej 1) (96)(96) 22-JAN-3007-06, 15, bkg - Mulu-Test Full Report -- ( Description : 4776, U-234 bkg (cnts/min) Parameter Units . cnts/min Parameter Type Measurement Time Sample ID Sample Analyst Value LU[SD]UD[BS Rej 0.0000 + 1.522-JAN-2007 06:25 bkg - Multi-Test Full Report --Description : 4788, Np-237 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej ..... -11 - 0000022 JAN-2007 06:25 bkg --- Multi-Test Full Report --Description : 4845, Th-229 bkg (cnts/min) Parameter Units : ents/min Parameter Type : Measurement Time Sample ID Sample Analyst Value UU|SD|UD|BS Rej .... Quality Assurance Multi-Test Full Report (continued) Page: 2 Measurement Time Sample ID Sample Analyst Value LUISDIUDIBS Rej 22-JAN-2007 06:25 bkg  $-0.0000 \pm 1.0$ -- Multi-Test Full Report --Description : 4882, Po-209 bkg (ents/min) Parameter Units ents/min Parameter Type ... Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 0.0000 22-JAN-2007 06:25 bkg -- Multi-Test Full Report --Description : 5423, Th-228 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej Quality Assurance Multi-Test Full Report (continued) Page: 3 Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0020 | | | -- Multi-Test Full Report --Description : 5486, Am-241 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0050 | | | -- Multi-Test Full Report --: 5499, Pu-238 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0050 | | | -- Multi-Test Full Report --Description : 5770, Pu-236 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

file ///P//Transfer/qal\_alp116\_7-feb-2007-08544095.txt 0.0090 22-JAN-2007 06:25 bkg -- Multi-Test Full Report --5805, Cm-244 bkg (cnts/min) Description Parameter Units : ents/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 0.0080 | | | 22-JAN-2007 06:25 bkg -- Multi-Test Full Report --Description : 6113, Cm-242 bkg (cnts/min) Parameter Units : cnts/min Parameter Type:

250

Measurement Time | Sample ID | Sample Analyst | Value | LU|SD|UD|BS Rej | ... さけに 原料はされた 中央部であったこと、お願さは1.1種 本は機会を対象を対象を対象をは 機能を使用を発酵を使用されるできなってきなっています。 しょく ちんごり 21-JAN-200° 09:01 chk 0 3450 141 122 -- Multi-Test Full Report --Description : Energy Calibration Slope Parameter Units: keV/chan Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 21-JAN-2007 09:01 chk 7.5703 Quality Assurance Report. Generated 7-FEB-2007 08:54:57.06 QA Filename : RDND06::RDND06\$DKA100:[ALP117.QA]GROUP\_1\_BKG.QAF;1 --- Multi-Test Full Report --Description : 4901, Pu-242 bkg (cnts/min) Parameter Units : ents/min Parameter Type : Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 0.0008 | | | 22-JAN-2007 06:25 bkg -- Multi-Test Full Report --Description : 5155, Pu-239 bkg (cnts/min) Parameter Units: cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej +11 = 0000.022-IAN-2007 06:25 bkg -- Multi-Test Full Report --Description 5275, Am-243 bkg (cnts/min) Parameter Units : cnts/min Parameter Type : Measurement Time Sample ID Sample Analyst Value LU[SD]UD[BS Rej

file:///P|/Transfer/qa1 alp117 7-feb-2007-08545828.txt

-- Multi-Test Full Report --Description 4010, Th-232 bkg (cnts/min) Parameter Type: Parameter Units . cpm Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 0.0004 22-JAN-2007 06:25 bkg -- Multi-Test Full Report --Description : 4688, Th-230 bkg (cnts/min) Parameter Units: cpm Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0004 | | | -- Multi-Test Full Report --Description : 4845, Th-229 bkg (cnts/min) Parameter Units : cpm Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0004 | | | -- Multi-Test Full Report --Description : 5423, Th-228 bkg (cnts/min) Parameter Type: Parameter Units : cpm Value LU|SD|UD|BS Rej Measurement Time Sample ID Sample Analyst 0.0000 | | | 22-JAN-2007 06:25 bkg

file:///P//Transfer/qal alp117\_7-feb-2007-08545828.txt

Onality Assurance Report. Generated 7-EEB 2007-08-35-04-24

OA Filename RDND06::RDND06\$DKA190 (ALPHS QA)GROUP (CHK.QAF)

-- Multi-Test Full Report --

Description : Efficiency, Am-241

Parameter Units . % Parameter Type:

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

21-JAN-2007 09:01 chk 0.3492

-- Multi-Test Full Report --

Description : Constant FWHM

Parameter Units : channels Parameter Type :

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

21-JAN-2007 09:01 chk 7.3333 | | |

- Multi-Test Full Report --

Description : Centroid, Am-241

Parameter Units : channels Parameter Type :

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

21-JAN-2007 09:01 chk 344.7234

-- Multi-Test Full Report --

Description . Average Efficiency

Parameter Units . % Parameter Type .

Investigate Level 2,000000 Action Level 13,000000

--- Sample Driven N-Sigma Test Parameters ---

Start Date 1 DEC-2003 00:00 End Date 30-MAY-2030 00:00

Mean 0.326330 Std Deviation 0.400064

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

file:///Pl/Transfer/qa1_alp118_7-feb-2007-08550796	ixt				
22-JAN-2007 06:25 bkg	0.0004		· · · · · · · · · · · · · · · · · · ·		
Multi-Test Full Report					
Description : 4688, Th-230 bkg (cnts/min)  Parameter Units : cnts/min Parameter Type :					
Measurement Time Sample ID	Sample Analyst	Value	LU SD UD BS Rej		
22-JAN-2007 06:25 bkg	0.0008				
Multi-Test Full Report					
Description : 4776, U-234 bkg (cnts/min) Parameter Units : cnts/min Parameter Type :					
Measurement Time Sample ID	Sample Analyst	Value	LU SD UD BS Rej		
22-JAN-2007 06:25 bkg	0.0012				
Multi-Test Full Report					
Description : 4788, Np-237 bkg (cnts/min) Parameter Units : cnts/min Parameter Type :					
Measurement Time Sample ID					
22-JAN-2007 06:25 bkg	0.0016		·· <b>·</b>		
Multi-Test Full Report					
Description : 4845, Th-229 bkg (cnts/min) Parameter Units : cnts/min Parameter Type :					
Measurement Time Sample ID	-				
Quality Assurance Multi-Test Full Report (continued) Page: 2					
Measurement Time Sample ID	Sample Analyst	Value	LU SD UD BS Rej		
22-JAN-2007 06:25 bkg	0.0020				

TE . . .

-- Multi-Test Full Report --Description : 4882, Po-209 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0020 | | | --- Multi-Test Full Report --Description : 4901, Pu-242 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0016 -- Multi-Test Full Report --Description : 5155, Pu-239 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 22-JAN-2007 06:25 bkg 0.0036 -- Multi-Test Full Report --Description : 5275, Am-243 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 0.0040 | | | 22-JAN-2007 06:25 bkg -- Multi-Test Full Report --: 5305, Po-210 bkg (cnts/min) Description Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

file:///P//Transfer/qa1\_alp118\_7-feb-2007-08550796.txt

Description : 5770, Pu-236 bkg (cnts/min)

Parameter Units | cnts/min | Parameter Type |

Measurement Time | Sample ID | Sample Analyst | Value | LU|SD|UD|BS Rej

22 JAN-2007 06.25 bkg | 0.0060 | | | |

- Mulu-l'est Full Report --

Description 5805, Cm-244 bkg (ents/min)
Parameter Units ents/min Parameter Type

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

22 JAN-2007 06:25 bkg 0.0104 | | |

- Mulu-Fest Full Report --

Description 6113, Cm-242 bkg (cnts/min)

Parameter Units cnts/min Parameter Type:

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

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Quality Assurance Report. Generated 7-FEB 2007 08:55:26.41 QA Filename :: RDND06::RDND06\$DKA100\\\\AITHPQA\]GROUP | CHK.QAF,I -- Multi-Test Full Report --Description : Efficiency, Am-241 Parameter Units: % Parameter Type · Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej ...... 23-JAN-2007 09:01 chk 0.2487 -- Multi-Test Full Report --: Constant FWHM Description Parameter Units : channels Parameter Type : Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 21-JAN-2007 09:01 chk 9.1667 -- Muhi-Test Full Report --Description : Centroid, Am-241 Parameter Units : channels Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 21-JAN-2007-09:01 chk 355.1082 - Multi-Test Full Report --Description : Average Efficiency Parameter Units . % Parameter Type: Action Level 3 000000 Investigate Level 2,000000 --- Sample Driven N-Sigma Test Parameters ----10-DEC-2000 00:00 End Date 30-MAY-2030 00:00 Start Date 0.260374 Std Deviation : 0.004557 Mean

Description : 5770, Pu-236 bkg (ents/min)

Parameter Units: cnts/min Parameter Type:

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

22-JAN-2007 06:25 bkg

0.0070

- Multi-Test Full Report --

Description : 5805, Cm-244 bkg (cnts/min)

Parameter Units : cnts/min Parameter Type :

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

22-JAN-2007 06:25 bkg 0.0100 | | |

-- Multi-Test Full Report --

Description : 6113, Cm-242 bkg (cnts/min)

Parameter Units : cnts/min Parameter Type :

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

.....

22-JAN-2007 06:25 bkg 0.0040 | | |

Quality Assurance Report. Generated 5-MAR-2007 16:16:54.28

OA Filenama QA Filename : RDND06::RDND06\$DKA100:[ALP120.QA]GROUP 1 CHK.QAF;1

-- Multi-Test Full Report --

Description

: Efficiency, Am-241

Parameter Units: %

Parameter Type:

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

21-JAN-2007 09:01 chk

0.2457 | | |

-- Multi-Test Full Report --

Description

: Constant FWHM

Parameter Units : channels

Parameter Type:

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

21-JAN-2007 09:01 chk

10.0000

-- Multi-Test Full Report --

Description

: Centroid, Am-241

Parameter Units: channels

Parameter Type:

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

21-JAN-2007 09:01 chk

357.0564 | | |

-- Multi-Test Full Report --

Description : Average Efficiency

Parameter Units: % Parameter Type:

Investigate Level: 2.000000

Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 10-DEC-2000 00:00 End Date : 30-MAY-2030 00:00

Mean

: 0.244296

Std Deviation: 0.003785

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 21-JAN-2007 09:01 chk 0.2422 | | | -- Multi-Test Full Report --Description : Energy Calibration Slope Parameter Type: Parameter Units: keV/chan Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 21-JAN-2007 09:01 chk 7.2279 | | | Quality Assurance Report. Generated 5-MAR-2007 16:16:55.68 QA Filename : RDND06::RDND06\$DKA100:[ALP120.QA]GROUP 1 BKG.QAF;1 -- Multi-Test Full Report --: 4010, Th-232 bkg (cnts/min) Description Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej \_\_\_\_\_ 22-JAN-2007 06:25 bkg 0.0010 | | | -- Multi-Test Full Report --: 4196, U-238 bkg (cnts/min) Parameter Units : cnts/min Parameter Type: Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 0.0000 | | | 22-JAN-2007 06:25 bkg -- Multi-Test Full Report --Description : 4396, U-235 bkg (cnts/min)

Sample Analyst Value LU|SD|UD|BS Rej

file:///P|/Transfer/qa1\_alp120\_5-mar-2007-16165816.txt (2 of 6)3/6/2007 12:46:34 AM

Parameter Units : cnts/min Parameter Type :

Measurement Time Sample ID

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

0.0000

22-JAN-2007 06:25 bkg

-- Multi-Test Full Report --

Description : 4882, Po-209 bkg (cnts/min)

Parameter Units : cnts/min Parameter Type :

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

22-JAN-2007 06:25 bkg 0.0000 | | |

-- Multi-Test Full Report --

Description : 4901, Pu-242 bkg (cnts/min)

Parameter Units : cnts/min Parameter Type :

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

-----

22-JAN-2007 06:25 bkg 0.0000 | | |

-- Multi-Test Full Report --

Description : 5155, Pu-239 bkg (cnts/min)

Parameter Units : cnts/min Parameter Type :

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

22-JAN-2007 06:25 bkg 0.0020 | | |

-- Multi-Test Full Report --

Description : 5275, Am-243 bkg (ents/min)

Parameter Units : cnts/min Parameter Type :

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

22-JAN-2007 06:25 bkg 0.0040 | | |

-- Multi-Test Full Report --

Description : 5305, Po-210 bkg (cnts/min)

Parameter Units : cnts/min Parameter Type :

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

\_\_\_\_\_

Description : 5770, Pu-236 bkg (cnts/min)

Parameter Units : cnts/min Parameter Type :

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

22-JAN-2007 06:25 bkg 0.0110 | | |

-- Multi-Test Full Report --

Description : 5805, Cm-244 bkg (cnts/min)

Parameter Units : cnts/min Parameter Type :

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

\_\_\_\_\_\_

22-JAN-2007 06:25 bkg 0.0140 | | |

-- Multi-Test Full Report --

Description : 6113, Cm-242 bkg (cnts/min)

Parameter Units : cnts/min Parameter Type :

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

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22-JAN-2007 06:25 bkg 0.0020 | | |

# ALPHA SAMPLE AND QC DATA

STL RICHLAND 349

SEVERN STL TRENT

Data Review/Verification Checklist RADIOCHEMISTRY, First Level Review

1/29/2007 9 50:35 AM

de di

No N/A

Yeşr No N/A

Yeşr No N/A

Yes No N/Ay

Yesy No N/A

Yes No N/A

Yes No N/A

No N/A

No N/A

Yes No N/A

Yes No N/A

Yes No N/A

Yes No N/A 1.11 在新沙

Yes No N/A

Yes No N/A

No N/A

No N/A

No N/A

No N/A

Yeş

Yes

No N/A

可能可以有精神的人自然的激素的 / 跨越 /

Lot No., Due Date:

J7A090287,J7A100115,J7A100118; 02/06/2007

Client, Site:

536403; AIR MONITORING Yerington Mine

QC Batch No., Method Test: 7011221; RALPHA-A Alpha by GPC-Am

SDG, Matrix:

1.0 COC

33442,33443,33444; FILTER

1.1	Is the ICOC page	complete; includes all	applicable analysis,	dates, SOP numbers	s, and revisions?
1					

2.1 Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?

2.2 Are the QC appropriate for the analysis included in the batch? Yeş•No N/A

医支充性脱脓性类原治疗病 形成 计大字网络 五字

- 2.3 Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc?
- 2.4 Does the Worksheets include a Tracer Vial label for each sample?

#### 3.0 QC & Samples

- 3.1 Is the blank results, yield, and MDA within contract limits?
- 3.2 Is the LCS result, yield, and MDA within contract limits?
- 3.3 Are the MS/MSD results, yields, and MDA within contract limits?
- 3.4 Are the duplicate result, yields, and MDAs within contract limits?
- 3.5 Are the sample yields and MDAs within contract limits?

- 4.1 Were results calculated in the correct units?
- 4.2 Were analysis volumes entered correctly?
- 4.3 Were Yields entered correctly?
- 4.4 Were spectra reviewed/meet contractual requirements?
- 4.5 Were raw counts reviewed for anomalies?

#### 5.0 Other (4) 公司 建油品基本产品 计语序 法法院 法法法院的 医线线 医二氏

- 5.1 Are all nonconformances included and noted?
- 5.2 Are all required forms filled out?
- 5.3 Was the correct methodology used?
- 5.4 Was transcription checked?
- 5.5 Were all calculations checked at a minimum frequency?
- 5.6 Are worksheet entries complete and correct?
- 6.0 Comments on any No response:

STL Richland

QAS\_RADCALCv4.8.26

First Level Review

Page 1

350



Data Review Checklist
RADIOCHEMISTRY
Second Level Review

QC Batch Number:	7011221	
------------------	---------	--

2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?  3. Are the correct isotopes reported?  B QC Samples  1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?  2. Does the blank result meet the Contract criteria?  3. Is the blank result < the Contract Detection Limit?			
<ol> <li>Are the sample yields within acceptance criteria?</li> <li>Is the sample Minimum Detectable Activity &lt; the Contract Detection Limit?</li> <li>Are the correct isotopes reported?</li> <li>QC Samples</li> <li>Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?</li> <li>Does the blank result meet the Contract criteria?</li> <li>Is the blank result &lt; the Contract Detection Limit?</li> <li>Is the blank result &gt; the Contract Detection Limit but the sample</li> </ol>	-/-		
Detection Limit?  3. Are the correct isotopes reported?  B QC Samples  1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?  2. Does the blank result meet the Contract criteria?  3. Is the blank result < the Contract Detection Limit?			
3. Are the correct isotopes reported?  B QC Samples  1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?  2. Does the blank result meet the Contract criteria?  3. Is the blank result < the Contract Detection Limit?			
B QC Samples  1. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?  2. Does the blank result meet the Contract criteria?  3. Is the blank result < the Contract Detection Limit?			
<ol> <li>Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?</li> <li>Does the blank result meet the Contract criteria?</li> <li>Is the blank result &lt; the Contract Detection Limit?</li> </ol>	/		
Contract Detection Limit?  2. Does the blank result meet the Contract criteria?  3. Is the blank result < the Contract Detection Limit?			1
<ul><li>2. Does the blank result meet the Contract criteria?</li><li>3. Is the blank result &lt; the Contract Detection Limit?</li></ul>			
3. Is the blank result < the Contract Detection Limit?			
4, Is the blank result > the Contract Detection Limit but the sample			
	ĺ	}	
result < the Contract Detection Limit?			1 /
5. Is the LCS recovery with contract acceptance criteria?			
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection			
Limit?			
8. Do the MS/MSD results and yields meet acceptance criteria?			
9. Do the duplicate sample results and yields meet acceptance		i	
criteria?	ļ		
C. Other			
1. Are all Nonconformances included and noted?			
2. Are all required forms filled out?			
3. Was the correct methodology used?	<del>                                     </del>		
4. Was transcription checked?			
5. Were all calculations checked at a minimum frequency?	-		
6. Were units checked?			

Second Level Review Therry a all a all Date: 1-29-07

LS-038B, Rev. 10, 8/02

Sample Preparation/Analysis 1/15/2007 12:30:46 PM Balance Id:1120373922 536403, Brown and Caldwell Brown & BA Gross Alpha PrpRC5016/5014 Pipet #: Caldwell S7 Gross Alpha by GPC using Am-241 curve 01 STANDARD TEST SET Sep1 DT/Tm Tech. AnalyDueDate: 02/05/2007 PM, Quote: SA, 63174 Batch: 7011221 FILTER pCi/sampl Sep2 DT/Tm Tech: SEQ Batch, Test: None Prep Tech: WoodT / A PA QC Tracer Ppt or Detector Count On | Off Work Order, Lot, Total Initial Aliquot Dish Count CR Analyst, Comments: Amt/Unit Prep Date Size Geometry Time Min ld (24hr) Circle Init/Date Sample DateTime Amt/Unit 23/07010 110 0.833sa,g 12.57g,in 1015 2107 1 JMK81-1-AE 1.0 J7A090287-1-SAMP AmtRec: FILTER #Containers: 1 Scr: 12/05/2006 12:25 Alpha: Beta: 2 JMLA1-1-AE 12.53g,in .0.833sa,q 10B 0.4 J7A090287-2-SAMP AmtRec: FILTER Scr: 12/05/2006 12:10 #Containers: 1 Alpha: Beta: 12.55g,in 3 JMLA4-1-AE 0.833sa,q 0.7 10C J7A090287-3-SAMP AmtRec: FILTER Scr: 12/05/2006 12:45 #Containers: 1 Albha: Beta: 4 JMLA7-1-AE 12 52q.in £.833sa,g 0.7 10D J7A090287-4-SAMP 12/05/2006 12:30 AmtRec: FILTER #Containers: 1 Scr: Alpha: Beta: 12.59g,in 5 JMLA8-1-AE 0.833sa,g 10F 0.9 J7A090287-5-SAMP AmtRec: FILTER #Containers: 1 Scr: Alpha: 12/05/2006 12:50 Beta: 6 JMLT2-1-AE 12.51q.in 0.833sa.c 1242 OA J7A100115-1-SAMP Scr: Alpha: 12/11/2006 11:40 AmtRec: FILTER #Containers: 1 Beta: 7 JMLT6-1-AE 0.833sa,g 12.60g.in 0.8 10B J7A100115-2-SAMP Scr: 12/11/2006 12:00 AmtRec: FILTER #Containers: 1 Alpha: Beta: ISV - Insufficient Volume for Analysis WO Cnt: 7 STL Richland Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 Page 1 Prep SamplePrep v4.8.26 pd - Prep Dt. r - Reference Dt. ec-Enrichment Cell. ct-Cocktailed Added Richland Wa.

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1/15/2007 12:30:48 PM		Samp	le Preparation/A	nalysis		Balance Id:112	20373922	
536403, Brown and Caldwell Caldwell	, Brown &	BA Gross Alpha F S7 Gross Alpha b	PrpRC5016/5014 by GPC using Am-241	curve		Pipet #: _		
ম AnalyDueDate: 02/05/2007		01 STANDARD TE			Sep1	DT/Tm Tech:		
Batch: 7011221 FILTER SEQ Batch, Test: None	pCi/sampl		PM, Quote: SA,	63174	Sep2	DT/Tm Tech:		
Batch: 7011221 FILTER SEQ Batch, Test: None			1 (88))) (88)) 88(8)			Prep Tech: W	oodT	
Work Order, Lot, Total Sample DateTime Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Ppt or Size Geometry	Count Time Min	Detector Count On		Analyst, hit/Date	Comments:
15 JMLV9-1-AE 0.833sa,g	12.54g,in	<u> </u>	1.5 0.8	150	10 F	1528	1/24/0	7 K
J7A100118-5-SAMP			(.7 0.0		10 7	1220	12110	7
12/13/2006 13:21	AmtRec: Fil	TER #Contain	ers: 1		Scr:	Alpha:	Be	ha:
	12.59g,in		0.4	De he	10.0	1010		
J7A110000-221-8LK)			0.1	17/2/	10B	1818		
12/05/2006 12:25	AmtRec:	#Containers:	1	1	Scr:	Alpha:	Bet	a:
17 JMN8V-1-AC-C	12.55g,in	ASC0424	1			<del></del>		
J7A110000-221/LCS		12/18/06,pd 02/09/06,r	0.5	1	10 A	Le	b	
12/05/2006 12:25	AmtRec:	#Containers:	1		Scr:	Alpha:	Bet	a·
Comments:					<del></del>	<del>`</del>		
1								
		i U/	11 0 - 0 1	0			2.0	
All Clients for Batch:		l li c	ollodion add	led to e	a. Simp.	1 (23/07)	FIFA	
536403, Brown and Caldwell		Brown & Cal	dwell	, SA , 63174				
JMK811AE-SAMP Constituent List: ALPHA RDL:20 pCi/sam	LCL:	UCL: RF	PD:					
JMN8V1AA-BLK: ALPHA RDL:20 pC1/sam JMN8V1AC-LCS:	LCL:	UCL: RP	PD:					
JMK811AE-SAMP Calc Info: Uncert Level (#s).: 2 Decay JMN8V1AA-BLK:	to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B				
	to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B				
	to SaDt: Y	Blk Subt.: N	Sci.Not.: Y	ODRs: B				
CTI Diabland   Kourla laikis A - C 5	and American Difference	and Amb of Court of	Cont. Flore 2	ICV I	Water Noting for Analysis		14/0.0	74.47
STL Richland Key: In - Initial Amt, fi - Fir	nai Amt, di - Dilul	ted Amt, s1 - Sep1, s2 iment Cell, ct-Cocktaili	,	isv - inst	ufficient Volume for Analys	515	wo c	m: 17

-

1/15/2007 12:30:51 F	PM		Samp	le Prep	paration/Ana	alysis		Baland	e ld:1120373922	
			A Gross Alpha Pi 7 Gross Alpha b	rpRC501	6/5014				pet #:	
AnalyDueDate: 02/0	5/2007		1 STANDARD TE					Sep1 DT/Tm	Tech:	
AnalyDueDate: 02/0: Batch: 7011221 SEQ Batch, Test: None		pCi/sampl						Sep2 DT/Tm	Tech:	
Jacq Batch, Test. None				1111111			)	Prep '	Tech: ,WoodT	
Work Order, Lot, Sample DateTime	Total Amt/Unit	Initial Aliquot Amt/Unit	QC Tracer Prep Date	Dish Size	Ppt or Geometry	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
					Approved	Ву			Date:	
1										
									_	
		fi - Final Amt, di - Diluted			Page 4	ISV - In	sufficient Volu	me for Analysis		O Cnt; 17 amplePrep v4.8.26
Richland Wa. P ນ	o - Prep Dt, 7 - 1	Reference Dt, ec-Enrichme	ent Ceir, ct-Cocktalle	- Auded						

1/29/2007 9:51 30 AM

## ICOC Fraction Transfer/Status Report ByDate: 1/29/2006, 2/3/2007, Batch: '7011221', User: \*ALL, Order By Date TimeAccepting

7011221	
IC CalcC WoodT 1/15/2007 10:14:21	
C wagarr IsBatched 1/11/2007 11:25:28 AM ICOC_RADCALC	v4.8.26
C WoodT InPrep 1/15/2007 10:14:21 AM RICH-RC-5016	Revision 5
C WoodT Prep1C 1/15/2007 12:31:51 PM RICH-RC-5016	REVISION 5
AshworthA InPrep2 1/23/2007 9:56:03 AM RICH-RC-5014	REVISION 6
AshworthA Prep2C 1/23/2007 4:52:32 PM RICH-RC-5014	<b>REVISION 6</b>
DAWKINSO InCnt1 1/23/2007 5:13:57 PM RICH-RD-0003	REVISION 4
DAWKINSO CalcC 1/24/2007 8:37:07 PM RICH-RD-0003	REVISION 4
WoodT 1/15/2007 12:31:51	
C AshworthA 1/23/2007 9:56:03	
C AshworthA 1/23/2007 4:52:32 PM	
AC DAWKINSO 1/23/2007 5:13:57 PM	
DAWKINSO 1/24/2007 8:37:07 PM	

AC: Accepting Entry; SC: Status Change

STL Richland Richland Wa.

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Grp Rec Cnt; 6 ICOCFractions v4.8.26

1/29/2007 9:	51:19 AM		Rpt DB Tra	anste	r Iog (	Batch	ı Kesi	uits)			
SDG or Batch	Rpt Db Id	OT-4	LotSample Clie	nt Id	Matrix	Recei	ved Date	Sample Dat			
<u>  Isotope                                   </u>	9JMK811		Oc Analysis Date F-08	Result 112	Cnt Uncert FILTER		<u>маа</u> 07 10:00:00	12/5/2006 1	xpected Yield 12:25:00 PM		unes.
ALPHA	BAS7	0	1/23/2007 7 52:27 PM 7.	3565E+00	1.942E+00	2 126E+00	5 371E+00	PCVSA	1.0	1 0E+0	1 9718-2
TH-228	9NS1	0	1/17/2007 10:03:53 PM3.	9481E-06	8.376E-02	8.376E-02	4.25E-01	PCI/SA	0 953	1.0E+0	7 881E-2
TH-230	9NS1	0	1/17/2007 10:03:53 PM3.	0258E-01	1 086E-01	1 116E-01	2.269E-01	PCI/SA	0.953	1.0E+0	7.881E-2
TH-232	9NS1	0	1/17/2007 10.03 53 PM-3		4 632E-02				0 953	1.0E+0	7.881E-2
3442	9JMLA1	10	J7A0902872 P-08	313	FIL FE	R 1/8/20	07 10:00:00	12/5/2006	12:10:00 PM		
ALPHA	BAS7	0	1/23/2007 7:52:27 PM 5.	0205E+00	1.488E+00	1 593E+00	3.811E+00	PCI/SA	1.0	1.0E+0	2.076E 2
TH-228	9NS1	0	1/17/2007 10:04:06 PM7.	7868E-02	1.828E-01	1 829E-01	8.388E-01	PCI/SA	0 438	1.0E+0	3 298E 2
TH-230	9NS1	0	1/17/2007 10:04:06 PM2.	2391E-01	1.346E-01	1.362E-01	4.477E-01	PCI/SA	0.438	1.0E+0	8.298E-2
TH-232	9NS1	0	1/17/2007 10:04:06 PM0.	0E+00	0.0E+00	8.345E02	4.477E-01	PCI/SA	0.438	1 0E+0	8.298E-2
3442	9JMLA4	10	J7A0902873 P-08	314	FILTE	R 1/8/20	07 10:00:00	12/5/2006	12 45:00 PM		
ALF'HA	BAS7	0	1/23/2007 7.52:27 PM 1.	021E+01	2.124E+00	2.428E+00	5.17E+00	PCI/SA	10	1.0E+0	2.024E-2
TH-228	9NS1	0	1/17/2007 10:04:25 PM1.	8576E-01	1 273E-01	1.283E-01	4.461E-01	PCI/SA	0.833	1.0F+0	8.115E.2
TH-230	9NS1	0	1/17/2007 10:04:25 PM1.	271E-01	9.165E-02	9.234E-02	3 05E-01	PCI/SA	0.833	1 0E+0	8.115E-2
TH-232	9NS1	0	1/17/2007 10:04:25 PM-2	.5423E-02	5.684E-02	5 689E-02	3.05E-01	PCI/SA	0.833	1.0E+0	8 115k-2
3442	9JMLA7	10	J7A0902874 P-08	315	FILTE	R 1/8/20	07 10:00:00	12/5/2006	12:30:00 PM		
ALPHA	BAS7	0	1/23/2007 7:52:27 PM 8.	5202E+00	1.921E+00	2.163E+00	4.521E+00	PCI/SA	1.0	1 0E+0	2.008E-2
TH-228	9NS1	0	1/17/2007 10:04:10 PM1.	636E-01	8.016E-02	8.133E-02	2.01E-01	PCVSA	0.996	1.0E+0	8.039E-2
TH-230	9NS1	0	1/17/2007 10:04:10 PM9.	5387E-02	5.94E-02	5.994E-02	1.632E-01	PCI/SA	0 996	1 0E+0	8 039E-2
TH-232	9NS1	0	1/17/2007 10:04:10 PM2.	044E-02	3.54E-02	3.544E-02	1.925E-01	PCI/SA	0 996	1.0E+0	B.039E-2
33442	9JMLA8	10	J7A0902875 000	580	FILTE	R 1/8/20	007 10:00:00	12/5/2006	12:50:00 PM		
ALPHA	BAS7	0	1/23/2007 7:52:27 PM 1.	2459E+01	2.199E+00	2.634E+00	4.493E+00	PCI/SA	1.0	1.0E+0	2.094E-2
TH-228	9NS1	0	1/17/2007 10:04:38 PM1.	1513E-01	7.339E-02	7.403E-02	2.472E-01	PCI/SA	0.893	1.0E+0	8.345E-2
TH-230	9NS1	0	1/17/2007 10:04:38 PM3		1.147E-01	1.188E-01	1.948E-01	PCI/SA	0.893	1.0E.+0	8.345E-2
TH-232	9NS1	0	1/17/2007 10:04:38 PM2	757E-02	3.515E-02	3.523E-02	1.651E-01	PCI/SA	0.893	1.0E+0	B.345E-
33443	9JMLT2	10	J7A1001151 P-0	816	FILTE	R 1/8/20	007 10:00:00	12/11/2006	6 11:40:00 AM		
ALPHA	BAS7	0	1/24/2007 11:27:16 2	.4671E+01	3.073E+00	4.223E+00	4.533E+00	PCVSA	1.0	1.0E+0	1 987E
TH-228	9NS1	0	1/17/2007 10:04:53 PM6	.952 <b>5E-0</b> 2	8.978E-02	8 998E-02	3 897E-01	PCI/SA	1.034	1.0E+0	7.981E
TH-230	9NS1	0	1/17/2007 10:04:53 PM1	.7867E-01	9.209E-02	9.337E-02	2.679E-01	PCI/SA	1 034	1.0E+0	7.981E-
TH-232	9NS1	0	1/17/2007 10:04:53 PM4	.4668E-02	4.994E-02	5.009E-02	2.679E-01	PCI/SA	1.034	1.0E+0	7.981E-
33443	9JMLT6	10	J7A1001152 P-0	817	FILTE	R 1/8/2	007 10:00:00	12/11/2000	6 12:00:00 PM		
ALPHA	BA\$7	0	1/24/2007 11:27:16 1	.7047E+01	2.595E+00	3.236E+00	4.148E+00	PCI/SA	1.0	1 0E+0	1.972E-
TH-228	9NS1	0	1/17/2007 10:05:00 PM3	.2653E-01	1.361E-01	1,391E-01	3.264E-01	PCI/SA	0.925	1 0E+0	7.84E-2
TH-230	9NS1	0	1/17/2007 10:05:00 PM3	.1463E-01	1.311E-01	1.34E-01	3.145E-01	PCI/SA	0.925	1.0E+0	7.84E-2
TH 232	9NS1	0	1/17/2007 10:05:00 PM0	.0E+00	0.0E+00	5.863E-02	3.145E-01	PCI/SA	0.925	1.0E+0	7.84E-2
33443	9JMLT7	10	J7A1001153 P-0	818	FILTE	R 1/8/2	007 10:00:00	12/11/200	6 12:15.00 PM		
ALPHA	BAS7	0		.0458E+01	2.807E+00	3.665E+06	4.808E+00	PCI/SA	1.0	1.0E+0	1.987E
TH-228	9NS1	0	1/17/2007 10:06:45 PM1	.0138E-01	8.838E-02	8.88E-02	3.408E-01	PCI/SA	1.003	1.0E+0	7 935F
TH-230	9NS1	0	1/17/2007 10:06:45 PM1	.9537E-02	4.368E-02	4.372E-02	2.344E-01	PCI/SA	1 003	1 0E+0	7.935F
TH-232	9NS1	0	1/17/2007 10:06:45 PM-	1.9536E-02	4.368E-02	4.372E-02	2.344E-01	PCI/SA	1.003	1.0E+0	7.935E
33443	9JMLT8	310	J7A1001154 P-0	819	FILTE	ER 1/8/2	007 10:00:0	12/11/200	06 11:45:00 AM		
ALPHA	BAS7	0	1/24/2007 11:27:16 1	.0219E+00	9.422E-01	9.498E-01	3.921E+0	PCI/SA	1.0	1.0E+0	2 078E
TH-228	9NS1	0	1/17/2007 10:06:45 PM5	.0395E-02	7.968E-02	7.98E-02	3.709E~01	PCI/SA	0 746	1.0E+0	8 314E
TH-230	9NS1	0	1/17/2007 10:06:45 PM9	.7115E-02	9.084E-02	9.125E-02	2 3 5 <b>74E-</b> 01	PCI/SA	0.746	1.0E+0	8.314E
TH-232	9N\$1	0	1/17/2007 10:06:45 PM-	2.4278E-02	5.429E-02	5.433E-02	2.912E-01	PCI/SA	0.746	1.0E+0	3.314E
33444	9JMLV3	310	J7A1001182 P-0	821	FILT	ER 1/8/2	2007 10:00:0	0 12/13/200	06 12:43:00 PM		
ALPHA	BAS7	0	1/24/2007 2:12:29 PM (	5.7087E+00	1.697E+00	1.86E+00	3.988E+0	0 PCI/SA	1.0	1.0E+0	2.0576
TH-228	9NS1	0	1/17/2007 10:06:45 PM2	2.1713E-01	9.95E-02	1.013E-0	1 2.605E-0°	PCI/SA	0.883	1.0E+0	8 297E
TH-230	9NS1	0	1/17/2007 10:06:45 PM	1.4675E-01	8.644E-02	8.737E-02	2 2 515E-0°	PCI/SA	0.883	1.0E+0	8.297E
TH-232	9NS1	0	1/17/2007 10:06:45 PM:	1.2578E-01	7.559E-02	7.637E-0	2 2.515E-0	I PCI/SA	0 883	1.0E+0	8.297E
33444	9JMLV	510	J7A1001183 P-0	0822	FILT	ER 1/8/2	200 <b>7 10:</b> 00.0	0 12/13/200	06 1:15:00 PM		
ALPHA	BAS7	0	1/24/2007 2:12:29 PM	E 6402E±00	1.6435+00	1 7665+0	0 4 653E+0	O POVSA	1.0	1.0E+0	2.0538

STL Richland, Wa Calc Review v4.8.26

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<sup>7011221,7011221, \*\*</sup>Samples Inserted | Updated | NotUpdated => 2 | 0 | 15, 
\*\*Results Inserted | ReTestInserted | Updated | NotInserted => 17 | 0 | 0 | 0. 
\*\*Diff RptDb | Qtims => .

SDG or Batch	Rpt Db Id		LotSample	Client Id	Matrix		ved Date		ole Date		
Isotope TH-228	Method 9NS1	RTst Q	c Analysis Date 1/17/2007 10:06:45	Result PM-4.4948E-02		Tot uncert 6.369E-02	4.174E-01	PCI/SA	<u>⊨xpected Yield</u> 0.869	1.0E+0	umes 8.203E-2
TH-230	9NS1	0	1/17/2007 10:06:45				2.603E-01		0.869	1.0E+0	8.203E-2
TH-232	9NS1	0	1/17/2007 10:06:45		0.0E+00		2.603E-01		0.869	1.0E+0	B.203E-2
33444	9JMLV81	10	J7A1001184	P-0824	FILTE		07 10:00:00		3/2006 1:18:00 PM		
ALPHA	BAS7	0	1/24/2007 2:12:29	PM 3.332E-02	7.576E-01	7.576E-01	3.963E+00	PCVSA	1.0	1.0E+0	2.066E-2
TH-228	9NS1	0	1/17/2007 10:06:45	PM0.0E+00	0.0E+00	8.769E-02	4.705E-01	PCVSA	0.55	1.0E+0	8.28E-2
TH-230	9NS1	0	1/17/2007 10:06:45	PM1.136E-01	1.136E-01	1.141E-01	4.542E-01	PCI/SA	0.55	1.0E+0	8.28E-2
TH-232	9NS1	0 .	1/17/2007 10:06:45	PM1.136E-01	1.136E-01	1.141E-01	4.542E-01	PCI/SA	0.55	1.0E+0	8.28E-2
33444	9JMLV91	1.0	J7A1001185	P-0582	FILTE	R 1/8/20	07:10:00:00	12/13	3/2006 1:21:00 PM		
ALPHA	BAS7	0	1/24/2007 2:12:29	PM 4.1991E+00	1.476E+00	1.555E+00	4.504E+00	PCI/SA	1.0	1.0E+0	2.041E-2
TH-228	9NS1	0	1/17/2007 10:06:45	5 PM8.0735E-02	6.055E-02	6.094E-02	2.421E-01	PCI/SA	0.905	1.0E+0	B.161E-2
TH-230	9NS1	0	1/17/2007 10:06:45	PM3.5078E-01	1.185E-01	1.223E-01	2.338E-01	PCI/SA	0.905	1.0E+0	8.161E-2
TH-232	9NS1	0	1/17/2007 10:06:45	PM0.0E+00	0.0E+00	4.358E-02	2.338E-01	PCI/SA	0.905	1.0E+0	8.161E-2
33443	9JMLVA	10	J7A1001155	000581	FILTE	R 1/8/20	07 10:00:00	12/1	1/2006 12:20:00 PM	•	
ALPHA	BAS7	0	1/24/2007 11:27:16	2.6821E+01	3.115E+00	4.452E+00	4.498E+00	PCVSA	1.0	1.0E+0	2.05E-2
TH-228	9NS1	0	1/17/2007 10:06:45	5 PM2.3414E-01	1.352E-01	1.369E-01	4:373E-01	PCI/SA	0.864	1.0E+0	8.202E-2
TH-230	9NS1	0	1/17/2007 10:06:45	PM2.5068E-01	1.149E-01	1.171E-01	3.007E-01	PCI/SA	0.864	1.0E+0	8.202E-2
TH-232	9NS1	0	1/17/2007 10:06:45	5 PM1.5041E-01	9.038E-02	9.143E-02	3.007E-01	PCI/SA	0.864	1.0E+0	8.202E-2
33444	9JMLVW	/10	J7A1001181	P-0820	FILTE	R 1/8/20	07 10:00:00	12/13	3/2006 12:10:00 PM		
ALPHA	BAS7	0	1/24/2007 2:12:29	PM 4.4092E+00	1.473E+00	1.564E+00	4.308E+00	PCI/SA	1.0	1.0E+0	2.084E-2
TH-228	9NS1	0	1/17/2007 10:06:45	5 PM8.4482E-02	8.448E-02	8.484E-02	3.378E-01	PCI/SA	0.801	1.0E+0	B.348E-2
TH-230	9NS1	0	1/17/2007 10:06:45	5 PM2.447E-01	1.246E-01	1.266E-01	3.262E-01	PCI/SA	0.801	1.0E+0	8.348E-2
TH-232	9NS1	0 .	1/17/2007 10:06:45	5 PM5.4377E-02	6.079E-02	6.1E-02	3.262E-01	PCI/SA	0.801	1.0E+0	B.348E-2
33442	JMN8V1	AB	J7A110000221	INTRA-LAB BL	ANK FILTE	R 1/8/20	07 10:00:00	12/5/	/2006 12:25:00 PM		
ALPHA	BAS7	0 B	1/24/2007 5:03:07	PM 2.2397E-04	1.262E-03	1.262E-03	6.457E-03	PCI/SA	1.0	1.0E+0	1.259E+1
33442	JMN8V1	CS	J7A110000221	INTRA-LAB CH	IECK FILTE	R 1/8/20	007 10:00:00	12/5	/2006 12:25:00 PM		

<sup>7011221,7011221, \*\*</sup>Samples inserted | Updated | NotUpdated => 2 | 0 | 15, 
\*\*Results Inserted | ReTestInserted | Updated | NotInserted => 17 | 0 | 0 | 0. 
\*\*Diff RptDb | Qtims => .

Alpha Beta, Alpha by GPC-Am, Results Batch Nbr: 7011221 1/24/2007 7:57:38 PM Summary Report Status Meth Wrk Ord Matrix Parameter Sa Act Uncert Units Av ILcC IDC QC Yield RYId Alpha by GPC-Am Richland Standard Gross Alpha/Beta Wo Blk Subt Calc S7 **FILTER** JMK811AE **ALPHA** 7.36E+00 (2.13E+00)PCI/SA R 2.21E+00 5.37E+00, 100% S7 Calc FILTER JMLA11AE **ALPHA** 5.02E+00 (1.59E+00)PCI/SA R 1.44E+00 3.81E+00 100% Calc S7 **FILTER ALPHA** JMLA41AE 1.02E+01 (2.43E+00)PCI/SA R 2.13E+00 5.17E+00 100% Calc **S**7 FILTER **ALPHA** JMLA71AE 8.52E+00 (2.16E+00)PCI/SA R 1.80E+00 4.52E+00 100% Calc **S7 FILTER** JMLA81AE **ALPHA** PCI/SA R 1.81E+00 4.49E+00 1.25E+01 (2.63E+00)100% Calc **S7** FILTER JMLT21AE ALPHA (4.22E+00)PCI/SA R 1.79E+00 4.53E+00, 100% 2.47E+01 Calc **S7** FILTER **JMLT61AE ALPHA** 1.70E+01 (3.24E+00)PCI/SA R 1.59E+00 4.15E+00 100% Calc **S7** FILTER JMLT71AE **ALPHA** 2.05E+01 (3.67E+00)PCI/SA R 1.94E+00 4.81E+00 100% **S7** Calc FILTER **ALPHA** (9.50E-01) U4 PCI/SA JMLT81AE 1.02E+00 R 1.51E+00 3.92E+00 100% Calc S7 **FILTER JMLVA1AE ALPHA** 2.68E+01 PCI/SA R 1.80E+00 4.50E+00 (4.45E+00)100% Calc **S7 FILTER** JMLVW1AE **ALPHA** 4.41E+00 (1.56E+00)PCI/SA R 1.70E+00 4.31E+00 100% Calc **S7** FILTER JMLV31AE **ALPHA** 6.71E+00 (1.86E+00)PCI/SA R 1.53E+00 3.99E+00 100% Calc **S7** FILTER JMLV51AE ALPHA 5.61E+00 (1.77E+00)PCI/SA R 1.88E+00 4.65E+00 100% Calc **S7** FILTER **ALPHA** JMLV81AE 3.33E-02 (7.58E-01) U4 PCI/SA R 1.53E+00 3.96E+00 100% Calc **S7** FILTER JMLV91AE **ALPHA** 4.20E+00 (1.55E+00)PCI/SA R 1.80E+00 4.50E+00 100%

(1.26E-03) U4 PCI/SA

PCI/SA

(2.18E-02)

**ALPHA** 

**ALPHA** 

2.24E-04

1.67E-01

JMN8V1AA

JMN8V1AC

? Cenecuser?

100%

100%

93%

R 2,47E-03 6.46E-03 B

R 2.81E-03 7.11E-03, S

() - (1s Uncertainities)
DC - Instrument Detection Level in Conc Units
MLcC- Method Decision Level in Conc Units
MDC - Minimum Detectable Concentration
\*Std - Lc, MDC using StdDev for Set of Blanks

Page 1

Q - Qualifier, U is Less Than Lc = 1.645\*TPU
All Results Displayed to Three Digits Reguardless of Significants
Date/Time - mm/dd/yy hh.mm, 24hr Time

RecCnt:17 RADCALC v4.8.26 STL Richland

Calc

Calc

**S7** 

**S7** 

**FILTER** 

**FILTER** 

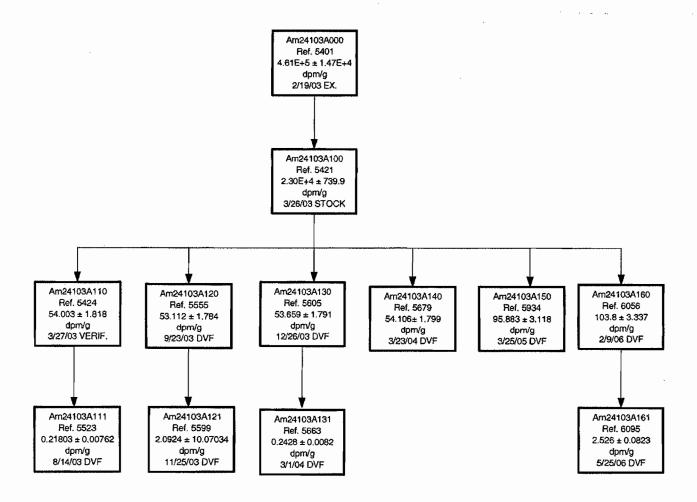
Sq Status Method N													
Status Method						Detailed Report	Report						
	Matrix P	Protocol Equation Set	t Wrk Ord	Units/Matrix	1	QC/BB Sa/On Date	AnalysisDate/PptWt	1	Sep1/Sep2 Date	QC/Tracer Vial	Vial Mult/EntYld	/ld Total/Analy Vol	ol Final/Count Vol
1 Calc S7 F 536403 P-0812	FILTER	STLE GabWoBS	WOBS JMK811AE ,J7A090287-1 v4.8.26	PCI/SA FILTER		12/05/06 12:25	01/23/07 19:52		-		-	1.00 Sa 0.019713 Sa	
Sq Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt Instr	Сеош	Trc/Av Ent	Efficiency1	Efficiency 2 Ent	YId Fct	Ent	BIk Value	Ingr Fct	Conv Fct/VolAdj Decay	Decay Abn
01/23/07 21:07	ALPHA	28 / 24	, `	GPC10A 1.5	Z ≻ A C)	4.3071E-01 1 (2.951E-02) (	1.0000E+00 N (0.000E+00)	100% 8%	z		1.0000E+00 (0.000E+00)	4.5045E-01 50.726735	1.0000E+00
Sq Calc Date	Parameter	Sa Ac	o >	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	k Vol Used		ield,EnFct	Chem Yld,E	Yield,EnFct Chem Yld,EFctU IDC/ILcC	BIKLcC/MDC	C StdDvMdC/LcC
01/24/07	ALPHA	R 7.356469 (2.125818)	1.38	1.38667E-01 (3.6612E-02)	0.321948 (0.091518)	0.321948 (0.091518)	(0.0141	1.00 Sa 142)	100%		5.371375	10.	
Sq Status Method P	Matrix F	Protocol Equation Set	t Wrk Ord	Units/Matrlx		QC/BB Sa/On Date	Analysis Date/PptWt		Sep1/Sep2 Date	QC/Tracer Vial	Vial Mult/EntYid	fid Total/Analy Vol	ol Final/Count Vol
2 Calc S7 F 536403, P-0813	FILTER	*STLE GabWoBS	WOBS JMLA11AE ,J7A090287-2 v4.8.26	PCI/SA FILTER		12/05/06 12:10	01/23/07 19:52				-	1.00 Sa 0.020762 Sa	
Sq Cnt Date	Parameter	Sample Cnt	Bkgmd Cnt Instr	Geom	Trc/Av Ent	Efficiency1	Efficiency 2 Ent	Yld Fct	Ent	Bik Value	Ingr Fct	Conv Fct/VotAdj Decay	Decay Abn
01/23/07 21:07	ALPHA	18 11	/ GPC1(	GPC10B 1.5	N >	4.2349E-01 1 (2.597E-02) (	1.0000E+00 N (0.000E+00)	100%	z		1.0000E+00 (0.000E+00)	4.5045E-01 48.163878	1.0000E+00
Sq Calc Date	Parameter	Avg Sa Act	ž	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	k Vol Used		'ield,EnFct	Chem Yld,	Yield, EnFct Chem YId, EFctU IDC/ILcC	C BIKLCC/MDC	C StdDvMdC/LcC
01/24/07	ALPHA	R 5.020511 (1.59349)	9.80	9.80000E-02 (2.9052E-02)	0.231409 (0.072457)	0.231409	(0.014	1.00 Sa 142)	100%		3.810514	4 0	
Sq Status Method	Matrix	Protocol Equation Set	t Wrk Ord	Units/Matrix	1	QC/BB Sa/On Date	AnalysisDate/PptWt		Sep1/Sep2 Date	QC/Tracer Vial	Vial Mult/EntYld	/ld Total/Analy Vol	ol Final/Count Vol
3 Cale SX F 536403, P.0814	FILTER	*STLE GabWoBS	WOBS JMLA41AE J7A090287-3 v4.8.26	PCI/SA FILTER		12/05/06 12:45	17		1	and the state of t	-	1.00 Sa 0.020239 Sa	A THE COMMON A LINE ALAMA ALAMA ALAMA
Sq Cnt Date	Parameter	Sample Cnt	Bkgrnd Cnt Instr	Geom	'Av Ent	į	Efficiency 2 Ent	Yld Fct	ا پ	Bik Value	Ingr Fct	Conv Fct/VolAdj Decay	Decay Abn
01/23/07 21:07	ALPHA	38 25	, GPC10C	oc 1.5	Z > Z 4. 5)	4.4325E-01 1 (2.861E-02) (	1.0000E+00 N (0.000E+00)	100% 8%	z		1.0000E+00 (0.000E+00)	4.5045E-01 49.410043	1.0000E+00
Sq Calc Date	Parameter	Avg Sa Act	ž	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	k Vol Used		'ield,EnFct	Chem Yld,	Yield,EnFct Chem Yld,EFctU IDC/ILcC	C BIKLCC/MDC	C StdDvMdC/LcC
01/24/07	ALPHA	H 10.209895 (2.42758)	2.03	2.03333E-01 (4.2295E-02)	0.458732 (0.106435)	0.458732 (0.106435)	(0.014	1.00 Sa 142)	100%		5.170073 2.132716	m (5	
Sq Status Method P	Matrix	Protocol Equation Set	it Wrk Ord	Units/Matrix		QC/BB Sa/On Date	AnalysisOate/PptWt	1	Sep1/Sep2 Date	QC/Tracer Vial	Vial Mult/EntYId	fid Total/Analy Vol	ol Final/Count Vol
4 Calc 87 F 536403, P-0815	FILTER	STLE GabWoBS	WOBS JMLA71AE ,J7A090287-4 v4.8.26	E PCI/SA		12/05/06 12:30	01/23/07 19:52				-	1.00 Sa 0.020082 Sa	Control and Control of
Sq Cnt Date	Parameter	Sample Cnt	Bkgmd Cnt Instr	Geom	Trc/Av Ent	Efficiency1	Efficiency 2 Ent	Yld Fct	Ent	Bik Value	Ingr Fct	Conv Fct/VolAdj Decay	Decay Abn
01/23/07 21:07	ALPHA	30 / 17	,	GPC10D 1.5	Z >	4.3701E-01 1 (2.932E-02) (	1.0000E+00 N (0.000E+00)	100%	z		1.0000E+00 (0.000E+00)	4.5045E-01 49.794998	1.0000E+00
. (1s Uncertainties	3). Q - Qualifie	r. U Result is Less Tha	n Lc = 1.645 * TF	P.U		Page 1	1				Rec	RecCnt:4 R/	RADCALC v4.8.26
C - Instrument Detect	tion Level in C	10 Construction Level in Cord Units, MLCC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration Sylvan the Combination of Each Sylvan and Y-30 Court, All Result Digits May Not be Significants. Date/Time - mm/dd/yy hh:mm, 24hr Time	hod Decision Lev 19/90 and Y-90 C	vel in Conc Us	nits, MDC-Mini	imum Detectable	e Concentration uts. Date/Time - mm/d	mm.qq wyp	24hr Time				STL Richland

State   Stat	Batch Nbr: 7011221	011221		Alpha Beta,		Alpha by GPC-Am	V GPC-	1	, Calculated Results	Resu	ts	i	1/24/20	1/24/2007 7:57:39 PM
States Method Marite Protect Equation Set 14:0000000-0 0.0394509   0.0144297   0.014429   0.01442		Parameter	Avg			Dpm Wo Bik	Dpm-Blk			Yield,EnFct	Chem Yld,E	FetU IDC/ILcC		
State   Method Native   Forence   Equation Set   With Card   Unitablative   Codes   Solicy   Basic   Codes	01/24/07	ALPHA		1.660(		0.379856 (0.094397)	0.379856 (0.094397)	(0.0141	.00 Sa 42)	100%		4.520571 1.797702		
Color=1077   Col	1		Protocol Equation Set	Wrk Ord	Units/Ma		4/On Date	AnalysisDate/Ppi		Sep2 Date	QC/Tracer \	Vial Mult/EntY	1	ì
Chicago   Parameer   Ang   Sa Act   Care	5 Cale &7 536408,000580	FILTER	Gab	JMLA81AE 7-5 v4.8.26	PCI/SA FILTER	12/05	/06 12:50	01/23/07 19:52			:	-	1.00 Sa 0.020942 Sa	
0.00000000   0.000000000   0.000000000	'	Paramete	Sample Cnt			c/Av Ent					31k Value	Ingr Fct	Conv Fct/VolAdj De	
150   150	0 01/23/07 21:0	•	19			z	ĺ		100%	z		1.0000E+00		000E+00
State   Parameter   Any State   Cate   Day   Day   Cate   Day				•		γ (2.9		).000E+00)	8%			(0.000E+00)		
01124/07   ALPHA   R 12459965   2555926-01 05770241   05770241041   0577024		Parameter	Avg		Cnt Rt	Dpm Wo Bik	Dpm-Blk			Yield,EnFct	Chem Yld,E	Fetu IDC/ILeC		
Status Method Markt   Protocol Equation Set   Wrk Ord   Unita Markt Ord   Code Sevon Date   Code Sev	01/24/07	ALPHA		2.553;		0.579241 (0.118693)	0.579241 (0.118693)	410.01	.00 Sa	100%		4.492944		
100   Salaria	•		Protocol Equation Set	Wrk Ord	Units/Ma	itrix QC/BB Sg	/On Date	1	1	Sep2 Date	QC/Tracer \	/ial Mult/EntY	1	
	Calc 36403,P-08	FILTER	Gab	JMLT21AE 5-1 v4.8.26	PCI/SA FILTER		/06 11:40	01/24/07 11:27				Andreas and agreement department of the second of the seco	1.00 Sa 0.019869 Sa	
1,000   1,00		Paramete	Sample Cnt						YId Fct		3ik Value	Ingr Fct	Conv Fct/VolAdj De	
150   Sale Data	0 01/24/07 12:4;	1		GPC10A	1.5	ı		l	100%	z		1.0000E+00	-	000E+00
Signate   Parameter   Avg   Sta Act   Q   Net Chit Rt   Dpm Wo Bit   Dpm-Bit   Vol Used   Vield.EnFert Chem Vid.EnFert   DloCit.e.C   Bitt.cc/MDO						√ (2.}		0.000E+00)				(0.000E+00)	50.33	
1,005   ALPHA   R 24,670734   4,6800E-01   1,08618   1,00818   1,00514   2,0177493   1,014142   1,005   1,791211   1,79121   1,79121   1,79121   1,79121   1,79121   1,79121		Parameter	Avg		Cut Rt	Dpm Wo Blk	Dpm-Blk			Yield,EnFct	Chem Yld,E	FetU IDC/ILcC		
Status Method Matrix   Protocol Equation Set   Wrk Ord   UnitsMatrix   QCBB SavOn Date   Analysis Dates   Protocol Equation Set   Protocol Equation	01/24/07	ALPHA		4.680(		1.08818 (0.177493)	1.08818 (0.177493)	(0.014	.00 Sa 42)	100%		4.532681		
Caic S7 FILTER   STIE GabWoBS   JMLT61AE   POUSA   12/11/06 12:00   01/24/07 11:27   1:00 Sa		3	Protocol Equation Set	Wrk Ord	Units/Ma	trix QC/BB Sa	/On Date	AnalysisDate/Ppi	1	Sep2 Date	QC/Tracer \	Vial Mult/EntY	1	ł
Caic Date   Parameter   Sample Ort   Bkgrnd Ort   Instr   Geom   Tro/Av   Enticlency1   Efficiency2   Enticlency2   Enticlency2   Enticlency3   Efficiency3   Efficiency3   Enticlency3   Enticlency3   Enticlency3   Enticlency3   Enticlency3   Enticlency4   Enticlency5   Enticlency5   Enticlency4   Enticlency5   Enticlency6   Enticlenc6	7 Calc S7 536403,P-0817	FILTER	Gat	JMLT61AE 5-2 v4.8.26	PCI/SA FILTER	12/11	/06 12:00	01/24/07 11:27					1.00 Sa 0.019717 Sa	
10000E + 00		Paramete	Sample Cnt						YId Fct		31k Value	Ingr Fct	Conv Fct/VolAdj De	
17.00   Status   Parameter   Avg   Sa Act   Q   Net Cnt Rt   Dpm Wo Bix   Dpm-Bix   Vol Used   Vield, Enfect   Chem Yld, EFCtU   IDC/LCC   BixLcC/MDC	İ	ĺ		GPC10E	3 1.5	z		Ì	100%	z		1.0000E+00	-	000E+00
01/24/07   ALPHA   R 17.046551   3.16000E-01   0.746175   0.746175   1.00 Sa   100%   4.147545   1.587414     Status Method Metrix   Protocol Equation Set   Wrk Ord   Units/Matrix   QC/BB Sa/On Date   AnalysisDate/PptWt   Sep1/Sep2 Date   QC/Tracer Vial Mult/EntYld   Total/Analy Vol Calc   S7   FILTER   STLE GabWoBS   JMLT71AE   PCI/SA   12/11/06 12:15   01/24/07 11:27   0.07		Parameter	Avg Sa Ac		Cnt Rt	Dpm Wo Bik	œ			Yield,EnFct	Chem Yld,E	FetU IDCALCC		
Status Method Matrix Protocol Equation Set Wrk Ord Units/Matrix QC/BB Sa/On Date AnalysisDate/PptWt Sep1/Sep2 Date QC/Tracer Vial Mult/EntYld Total/Analy Vol Calc S7 FILTER 'STLE GabWoBS JMLT71AE PCL/SA 12/11/06 12:15 01/24/07 11:27 1 1.00 Sa 0.01 / 0.01987 Sa 0.01987	01/24/07	ALPHA	1	3.160(	_	0.746175 (0.136246)	0.746175 (0.136246)	(0.014)	.00 Sa 42)	100%		4.147546 1.587414		
1 1.00 Sa 0.01987 Sa Bik Value Ingr Fct Conv Fct/VolAdj Decay RecCnt:8 RADCALC v4.8.2	•	1	Protocol Equation Set	Wrk Ord	Units/Ma		VOn Date	AnalysisDate/Ppi		Sep2 Date	QC/Tracer \	1	1	1
Bik Value Ingr Fct Conv FctVolAdj Decay  RecCnt:8 RADCALC v4.8.	Calc 16403,P-08	FILTER	Gab	JMLT71AE 5-3 v4.8.26	PCI/SA FILTER		/06 12:15	01/24/07 11:27			No. of the case of	A COLUMN TO THE PROPERTY OF TH	1.00 Sa 0.01987 Sa	
RecCnt:8		Paramete	Sample Cnt			Ent		- 1	YId Fct		3ik Value	Ingr Fct	Conv Fct/VolAdj De	
	() - (1s Uncertainiti	ies), Q - Qualifi ection Level in (	er, U Result is Less Than Sonc Units, MLCC - Metho	Lc = 1.645 * TPU	in Conc Uni	its, MDC-Minim	Page 2	Concentration		j.		RecC	Vinda street of other time of	CALC v4.8.26 Richland

State   Parameter   Ast   State   St	Batch Nbr: 7011221		Alpha Beta,	-	Alpha by GPC-Am	, Calculated Results	ed Resu	ılts		1/24/2007 7:57:40 PM
4.504275 1.801634  QC/Tracer Visit Mult/Ent/Yid Total/Analy Vol  1.0000E+00 4.5045E-01 1.000 1.0000E+00 0.079428 1.0000E+00 0.079428 0.0002472 QC/Tracer Visit Mult/Ent/Yid Total/Analy Vol ASC0424 1 1.0058a ASC0424 1 1.0058a ASC0424 1 1.000E+00 1.000B40 0.000E+00 0.079681 1.0000E+00 0.079681	Calc Date	Avg		Dpm Wo Bik	Opm-Blk	Vol Used	Yleld,EnFc	t Chem Yld,E	FetU IDC/ILcC	
1.00 Sa   1.00 Sa   1.00 Sa   12.59 Sa   1.0000E+00   4.5045E-01   1.0000E+00   0.079428   1.0000E+00   0.079428   1.0000E+00   0.079428   1.0000E+00   0.002472   0.002472   0.002472   0.002472   0.002472   0.002472   0.002472   0.002472   0.002472   0.002472   0.002472   0.002472   0.002472   0.000E+00   0.079681   0.000E+00   0.079681   0.000E+01   0.002811			8.40000E-02 (2.9530E-02)	0.19026 (0.069753)	0.19026 (0.069753)	1.00 Sa (0.014142)	100%		4.504275	
1	Status Method						p1/Sep2 Date	QC/Tracer \		1
Bik Value Ingr Fet Conv FctVoladij Dec 1.0000E+00 4.5045E-01 1.000 (0.000E+00) 0.079428 (0.000E+00) 0.079428 (0.000E+00) 0.079428 (0.006457 0.002472 0.002472 0.002472 0.002472 0.002472 0.002472 0.002472 0.002472 0.002472 0.002472 0.000E+00 4.5045E-01 1.000 (0.000E+00) 0.079681 0.000E+00) 0.079681 0.0002811 0.0002811 0.002811		*STLE GabWoBS	V8V1AA	<u>α</u>		/24/07 17:03 4				1.00 Sa 12.59 Sa
1,0000E+00 4,5045E-01 1,000 (0,000E+00) 0.079428 1 Chem Yid,EFctU iDC/ILcC BikLcC/MDC 0,002472 QC/fracer Vial Mult/EntYld Total/Analy Vol ASC0424 1 1,00 Sa ASC0424 Alq 12.55 Sa Bik Value Ingr Fct Conv Fct/VolAdj Dec 1,0000E+00) 0.079681 t Chem Yid,EFctU iDC/ILcC BikLcC/MDC 93% 0,007113 0,002811 RECC/ITTT RADC	Curbete		instr	Trc/Av Ent		Ent		Bik Value		nv Fct/VolAdj Decay
Chem Yid, Efett I IDC/ILCC  0.006457  0.002472  QC/Tracer Vial Mult/EntYld Total/Analy Vol ASC0424 1 1.00 Sa ASC0424 Alq 12.55 Sa Bik Value Ingr Fet Conv Fct/VolAdj Dec 1.0000E+00 0.079681 t Chem Yid, EFett I IDC/ILCC BikLcC/MDC 93% 0.007113 0.002811 RECCN:17 RADC	1	12 /	,	z	_	z			;	10
0.002472 0.002472 0.002472 0.002472  ASC0424 1 1.00 Sa ASC0424 Alq 12.55 Sa Bik Value Ingr Fct Conv FctvolAdj Dec 1.0000E+00 4.5045E-01 1.00 (0.000E+00) 0.079681 t Chem Yid,EFctU IDC/ILCC BikLcC/MDC 93% 0.007113 0.002811 RecCnt:17 RADC	Calc Date	Avg Sa Act	a	Dpm Wo Bik	ά	Used	-	t Chem Yld,E	FetU IDCALCC	cc/MDC
ASCO424 1 1.00 Sa  ASCO424 1 1.00 Sa  ASCO424 Alq 12.55 Sa  Bik Value Ingr Fct Conv Fct/VolAdj Dec 1.0000E+00 4.5045E-01 1.000 (0.000E+00) 0.079681 t Chem Yid, EFetU IDC/ILCC BIKLCC/MDC 93% 0.007113 0.002811 RECC/ITTT RADC			i	0.00626 (0.035278)	0.00626 (0.035278)	1.00 Sa (0.014142)	100%		0.006457	
ASC0424 1 1.00 Sa  ASC0424 Alq 12.55 Sa  Bik Value Ingr Fot Conv FcivVoladj Decay 1.0000E+00 4.5045E-01 1.0000E+00 (0.000E+00) 0.079681 t Chem Yid,EFciU IDC/ILCC BikLcC/MDC StdDvMdC, 93% 0.007113 0.002811 RecCnt:17 RADCALC v4.8.5	Sq Status Method Matrix	Protocol Equation Set	1			ı	p1/Sep2 Date	QC/Tracer \	4	1
Bik Value Ingr Fct Conv Fct/VolAdj Decay 1.0000E+00 4.5045E-01 1.0000E+00 (0.000E+00) 0.079681 t Chem Yid,EFctU IDC/ILcC BikLcC/MDC StdDvMdC 93% 0.007113 0.002811 RecCnt:17 RADCALC v4.8.2	17 Caic S7 KILTER 0,INTRA-LXB CHECK	Gab	18V1AC	S		/24/07 17:03 .5 ~		ASC0424 ASC0424	1 Alq	1.00 Sa 12.55 Sa
1.0000E+00 4.5045E-01 1.000 (0.000E+00) 0.079681 93% 0.007113 0.002811 PecCnt:17 RADC	Cnt Date		Instr	Trc/Av		Ent	Eut	Bik Value		nv Fct/VolAdj Decay
93% 0.007113 0.002811 PECCNIT BIALCC/MDC 93% 1.002811 1.002811 1.002811 1.002811 1.002811 1.002811	01/24/07 18:18	16 /		z		z			i	5045E-01 1.0000E+00 079681
93% 0.007113 0.002811 PecCnt:17	Calc Date	Avg Sa Act	o	Dpm Wo Bik	Dpm-Bik	Vol Used	Yield,EnFc		FetU IDCALeC	
RecOnt.17			2.01467E+00 (1.1708E-01)	4.643191 (0.558555)	4.643191 (0.558555)	1.00 Sa (0.014142)	100%	%86	0.007113	
RecOnt:17										i.e.
RecOnt:17										
RecCnt.17				•			,			
RecCnt.17									,	
RecOnt:17										
RecOnt.17										
RecCnt:17										
Recont.17								•		
RecCnt:17		,	,							
RecCnt:17									,	
	() - (1s Uncertainities), Q - Quailf IDC - Instrument Detection Level in 1900 or on the sea Decision from the	Conc Units, MLcC - Methor	Lc = 1.645 * TPU d Decision Level in Conc U	Inits, MDC-Minimur	Page 5 m Detectable Conc	entration	amit after		Recont	County of the control of

## ALPHA

## STANDARDS AND TRACEABILITY



STL RICHLAND

#### AM241-2003

#### ISOTOPE DILUTION RECORD

1) Prepared by tda	2) Date Prepared	2/9/2006
3) Source Identification Number / Ref. Number	AM24103A100	5421
4) Source Activity (dpm ± dpm/g)	2.2910E+04 ±	7.365E-02
5) Percent error of Source Activity	3.215 %	
6) Weight of Source Material used (g)	1.0007	
7) (% Error) of Weight of Source Material used	0.4797 %	
8) Diluent	2 M HNO3	
9) Total Weight of the Dilution (g)	220.87	
10) (% Error) of Total Weight of the Dilution	0.1358 %	
11) Specific Activity of Diluted Solution dpm/g	1.0380E+02 ±	3.377E+00
12) Total Uncertainty	3.253 %	
13) Dilution Identification Number / Ref. Number	AM24103A160	6056
14) Calibration Reference Date	2/9/2006	
15) Isotope Inventory File update by/date	tda	2/9/2006
16) Reviewed by/date		
17) Location qclab	18) Exhausted	
CALCULATIONS	************	•
7) % Error of Wt. used = (0.0048 / Weight of Source Material used	* 100)	
10) % error of Dilution Wt. = (0.3 / Total Weight of Dilution * 100)		
11) Specific Activity = Source Activity * Wt. of Source Material used	/ Total Wt. of the Dilution	
12) % Total Uncertainty = (% error of Source Activity ^2 + 9	6 error of Wt. Used^2 + % error o	of Dilution Wt.^2)

#### 03A.xls

#### ISOTOPE DILUTION RECORD

1) Prepared by W.G	2) Date Prepared	3/25/2005
3) Source Identification Number / Ref. Number	AM24103A100	5421
4) Source Activity (dpm ± dpm/g)	2.2940E+04 ±	7.375E+02
5) Percent error of Source Activity	3.215 %	
6) Weight of Source Material used (g)	1.0186	
7) (% Error) of Weight of Source Material used	0.4712 %	
8) Diluent	2M HNO3-P0500135	<del></del> .
9) Total Weight of the Dilution (g)	243.7	•
10) (% Error) of Total Weight of the Dilution	0.1231 %	
11) Specific Activity of Diluted Solution dpm/g	9.5883E+01 ±	3.118E+00
12) Total Uncertainty	3.252 %	
13) Dilution Identification Number / Ref. Number	AM24103A150	5934
14) Calibration Reference Date	3/25/2005	
15) Isotope Inventory File update by/date	W.G	3/25/2005
16) Reviewed by/date	sew	3/28/2005
17) Location QCLAB/STWT1132	18) Exhausted	
CALCULATIONS	****************	*
7) % Error of Wt. used = (0.0048 / Weight of Source Material used		
10) % error of Dilution Wt. = (0.3 / Total Weight of Dilution * 100)		
11) Specific Activity = Source Activity * Wt. of Source Material used	/ Total Wt. of the Dilution	
12) % Total Uncertainty = (% error of Source Activity ^2 + 9	% error of Wt. Used^2 + % error of	of Dilution Wt.^2)

#### 03A.xls

#### ISOTOPE DILUTION RECORD

1) Prepared by W.G	2) Date Prepared	3/23/2004
3) Source Identification Number / Ref. Number	AM24103A100	5421
4) Source Activity (dpm ± dpm/g)	2.2977E+04 ±	7.387E+02
5) Percent error of Source Activity	3.215 %	
6) Weight of Source Material used (g)	0.5744	
7) (% Error) of Weight of Source Material used	0.8357 %	
8) Diluent	2M HNO3-P0400085	
9) Total Weight of the Dilution (g)	243.93	
10) (% Error) of Total Weight of the Dilution	0.1230 %	
11) Specific Activity of Diluted Solution dpm/g	5.4106E+01 ±	1.799E+00
12) Total Uncertainty	3.324 %	
13) Dilution Identification Number / Ref. Number	AM24103A140	5679
14) Calibration Reference Date	3/23/2004	
15) Isotope Inventory File update by/date	W.G	3/23/2004
16) Reviewed by/date	SEW	3/26/2004
17) Location QCLAB/STWT0942	18) Exhausted	
CALCULATIONS	************	
7) % Error of Wt. used = (0.0048 / Weight of Source Material used	* 100)	
10) % error of Dilution Wt. = (0.3 / Total Weight of Dilution * 100)		
11) Specific Activity = Source Activity * Wt. of Source Material used	/ Total Wt. of the Dilution	
12) % Total Uncertainty = (% error of Source Activity ^2 + 9	% error of Wt. Used^2 + % error of	Dilution Wt.^2)

### ISOTOPE DILUTION RECORD

1) Prepared by W.G	2) Date Prepared	12/26/2003
3) Source Identification Number / Ref. Number	AM24103A100	5421
4) Source Activity (dpm ± dpm/g)	2.2986E+04 ±	7,390E+02
5) Percent error of Source Activity	3.215 %	
6) Weight of Source Material used (g)	0.5414	
7) (% Error) of Weight of Source Material used	0.8866 %	
8) Diluent	2M HNO3-P0300705	
9) Total Weight of the Dilution (g)	231.92	
10) (% Error) of Total Weight of the Dilution	0.1294 %	
11) Specific Activity of Diluted Solution dpm/g	5.3659E+01 ±	1.791E+00
12) Total Uncertainty	3.338 %	
13) Dilution Identification Number / Ref. Number	AM24103A130	5605
14) Calibration Reference Date	12/26/2003	
15) Isotope Inventory File update by/date	W.G	12/26/2003
16) Reviewed by/date	SEW	1/5/2004
17) Location QCLAB/STWT0894	18) Exhausted	
***************************************	<i><b>7.57.247.747.747.747.747.747.747.747.747.74</b></i>	
CALCULATIONS		
7) % Error of Wt. used = (0.0048 / Weight of Source Material used	* 100)	
10) % error of Dilution Wt. = (0.3 / Total Weight of Dilution * 100)		
11) Specific Activity = Source Activity * Wt. of Source Material used	I / Total Wt. of the Dilution	
121 % Total Lincertainty = (1% error of Source Activity ^2 + 9	% error of Wt. Used^2 + % error of	f Dilution Wt ^2)

#### ISOTOPE DILUTION RECORD

1) Prepared by W.G	2) Date Prepared	9/23/2003
3) Source Identification Number / Ref. Number	AM24103A100	5421
4) Source Activity (dpm ± dpm/g)	2.2996E+04 ±	7.393E+02
5) Percent error of Source Activity	3.215 %	
6) Weight of Source Material used (g)	0.4983	
7) (% Error) of Weight of Source Material used	0.9633 %	
8) Diluent	2M HNO3-P0300455	
9) Total Weight of the Dilution (g)	215.75	
10) (% Error) of Total Weight of the Dilution	0.1390 %	
11) Specific Activity of Diluted Solution dpm/g	5.3112E+01 ±	1.784E+00
12) Total Uncertainty	3.359 %	
13) Dilution Identification Number / Ref. Number	AM24103A120	5555
14) Calibration Reference Date	9/23/2003	
15) Isotope Inventory File update by/date	W.G	9/23/2003
16) Reviewed by/date	SEW	9/24/2003
17) Location QCLAB/STWT0853	18) Exhausted	617
***************************************	*************	
CALCULATIONS		
7) % Error of Wt. used = (0.0048 / Weight of Source Material used *	100)	
10) % error of Dilution Wt. = (0.3 / Total Weight of Dilution * 100)		
11) Specific Activity = Source Activity * Wt. of Source Material used /	Total Wt. of the Dilution	
19) 9/ Tatal I Incode into	array of IME Honday , 9/	Dilution 14/4 ACI

#### ISOTOPE DILUTION RECORD

1) Prepared by W.G	2) Date Prepared	3/26/03
3) Source Identification Number / Ref. Number	AM24103A000	5401
4) Source Activity (dpm ± dpm/g)	4.6049E+05 ±	1.474E+04
5) Percent error of Source Activity	3.2 %	
6) Weight of Source Material used (g)	5.0651	
7) (% Error) of Weight of Source Material used	0.0948 %	
8) Diluent	2M HNO3-P0300164	
9) Total Weight of the Dilution (g)	101.35	
10) (% Error) of Total Weight of the Dilution	0.2960 %	
11) Specific Activity of Diluted Solution dpm/g	2.3014E+04 ±	7.399E+02
12) Total Uncertainty	3.215 %	
13) Dilution Identification Number / Ref. Number	AM24103A100	5421
14) Calibration Reference Date	3/26/03	
15) isotope Inventory File update by/date	W.G	3/26/03
16) Reviewed by/date	SEW	3/26/03
17) Location QC <u>LAB/STWT0</u> 754	18) Exhausted	**************************************
**************************************	***********	****
CALCULATIONS		
7) % Error of Wt. used = (0.0048 / Weight of Source Material used	d*100)	•
10) % error of Dilution Wt. = (0.3 / Total Weight of Dilution * 100)		
<ol> <li>Specific Activity = Source Activity * Wt. of Source Material u</li> </ol>	sed / Total Wt. of the Dllution	
12) % Total Uncertainty = (% error of Source Activity ^2 +	% error of Wt. Used^2 + % error o	of Dilution Wt.^2)

#### ISOTOPE RECORD FORM

1) Isotope	Am-241	2) Reference Number	5401
3) Half Life	433 yrs.	4) Storage Location	Std. Lab
5) Source Ide	entification Number_	Am24	103A000
******	**************************************	ALIBRATION DATA	*********
6) Activity as I	Received Units	3.9238	E+04 dps
7) Overall Und	certainty Percent	3	.2%
8) Reference l	Date / Time	19-FEB-03 12:	00 EST (9:00AM)
9) Activity dp	nm/g	4.6056E+5 ± 1	.4740E+4 dpm/g
10) Volume or	Mass (ml/g)	5.11	069 g
11) Calibrated	by	ANAL	YTICS
12) Certificate	Solution Number	6562	21-310
*****	**************************************	**************************************	*****
13) Date Recei	ived		2/24/03
14) Surveyed b	py	territoria, and the second	W.G
15) Survey Reading (Beta/Gamma) cpm <100 outside of surface			
16) Survey Reading (Alpha) cpm <100 outside of surface			outside of surface
**********************			
17) Activity Cor	nversion 3 <u>.923E+04dp</u>	os*60s/m/5.011069g = 4.60	06E+05 ± 1.474E+04 dpm/g
18) Remarks			
	V-d		
19) Isotope File	Updated by	W.G 2/24/0	
20) QC Approve	ed .	SEW 3	3/11/03



#### **ANALYTICS**

Rec. X1380 Seaboard Industrial Blvd. Atlanta, Georgia 30318 · U.S.A. Phone (404) 352-8677 Fax (404) 352-2837

### CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

65621-310

Am-241 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:

Am-241

ACTIVITY (dps):

3.923 E4

HALF-LIFE:

4.322 E2 years

CALIBRATION DATE:

February 19, 2003 12:00 EST

TOTAL UNCERTAINTY\*:

3.2%

SYSTEMATIC:

2.2%

RANDOM:

1.0%

\*99% confidence level.

5.11069 grams 1M HCl solution.

Impurities: γ-impurities <0.1%  $\alpha$ -impurities <0.1%

P O NUMBER

1703541-000 OP, Item 1

SOURCE PREPARED BY:

M. Taskaeva, Radiochemist

Q A APPROVED:

# ALPHA CONTINUING CALIBRATION

STL RICHLAND 392

Quality Assurance Report. Generated 6-FEB-2007 16:04:43.24

QA Filename : \$DISK1:[QUAD10.QA]CHK.QAF;2

-- Multi-Test Full Report --

Description : Quad10A (Hex 1) alpha %Eff

Parameter Units :\ Parameter Type : Generic

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 47.599998 Upper Bound : 50.500000

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JAN-2006 00:00 End Date : 1-JUL-2006 00:00

Mean : 49.065498 Std Deviation : 0.463531

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

1-JAN-2007 11:32 CHK 49.1000 1-JAN-2007 11:57 CHK No Value 49.1000 2-JAN-2007 04:55 CHK 3-JAN-2007 06:18 CHK 48.7000 3-JAN-2007 06:40 CHK No Value 4-JAN-2007 05:38 CHK 49.5000 5-JAN-2007 05:33 CHK 49.2000 6-JAN-2007 06:35 CHK 49.3000 8-JAN-2007 05:06 CHK 48.9000 9-JAN-2007 04:59 CHK 49.6000 9-JAN-2007 05:26 CHK No Value 49.7000 10-JAN-2007 05:20 CHK 11-JAN-2007 05:57 CHK 49.3000 11-JAN-2007 06:20 CHK No Value 12-JAN-2007 05:30 CHK 49.2000 13-JAN-2007 06:09 CHK 49.1000 13-JAN-2007 06:33 CHK No Value 14-JAN-2007 09:57 CHK 49.2000 14-JAN-2007 10:21 CHK No Value 15-JAN-2007 05:03 CHK 49.2000 16-JAN-2007 06:18 CHK 49.0000

me.///t // maisiet/qa1_gpe10_0-1e0-200/-100-4-018.txt	•	
17-JAN-2007 04:55 CHK	49.9000	
18-JAN-2007 06:08 CHK	49.2000	
18-JAN-2007 06:35 CHK	No Value	
19-JAN-2007 05:52 CHK	48.6000	
19-JAN-2007 06:18 CHK	No Value	
22-JAN-2007 05:09 CHK	49.4000	
22-JAN-2007 05:33 CHK	No Value	
23-JAN-2007 05:04 CHK /	49.2000	
24-JAN-2007 06:08 CHK	49.0000	
25-JAN-2007 05:40 CHK	48.6000	
26-JAN-2007 06:11 CHK	48.6000	
26-JAN-2007 06:33 CHK	No Value	
27-JAN-2007 07:37 CHK	49.4000	
29-JAN-2007 05:13 CHK	48.9000	
30-JAN-2007 05:21 CHK	49.4000	
30-JAN-2007 05:44 CHK	No Value	
31-JAN-2007 05:13 CHK	49.0000	
Quality Assurance Multi-Test Full Repo	ort (continued) Page : 2	
Measurement Time Sample ID San	nple Analyst Value LU SD UD BS Re	ij
1-FEB-2007 05:05 CHK	48.6000	
1-FEB-2007 05:32 CHK	No Value	
2-FEB-2007 05:09 CHK	49.1000	
3-FEB-2007 10:57 CHK	49.4000	
Multi-Test Full Report		
	0.477.00	
Description : Quad 10B (Hex 2) alph		
Parameter Units : Parameter	er Type : Generic	
7.		
Lower/Upper Bounds Test Param		
Lower Bound : 40.400002 Upp	per Bound : 43.000000	
I	T 1 2 000000	
Investigate Level: 2.000000 Action	on Level : 3.000000	
Commis Duisses M Circus Toot De		
Sample Driven N-Sigma Test Par		
Start Date : 1-JAN-2006 00:00 End		
Mean : 41.726315 Std Dev	7auon: 0.416309	
Maggurament Time Comple ID Com	nnle Anglyet Volue I HICHHIDE De	.:
wieasurement time sample iD san	mple Analyst Value LU SD UD BS Re	ΞJ
1-JAN-2007 11:32 CHK	41.8000	
1-JAIN-2007 11.32 CAK	41.8000	

me.///1 // transier/qa1_gpe10_0-1e0-2007-10044016.txt		
1-JAN-2007 11:57 CHK	No Value	
2-JAN-2007 04:55 CHK	41.7000	
3-JAN-2007 06:18 CHK	41.3000	
3-JAN-2007 06:40 CHK	No Value	
4-JAN-2007 05:38 CHK	41.9000	
5-JAN-2007 05:33 CHK	41.8000	
6-JAN-2007 06:35 CHK	42.3000	
8-JAN-2007 05:06 CHK	40.9000	
9-JAN-2007 04:59 CHK	41.9000	
9-JAN-2007 05:26 CHK	No Value	
10-JAN-2007 05:20 CHK	42.0000	
11-JAN-2007 05:57 CHK	41.2000	
11-JAN-2007 06:20 CHK	No Value	
12-JAN-2007 05:30 CHK	41.9000	
13-JAN-2007 06:09 CHK	39.5000	Be Ac
13-JAN-2007 06:33 CHK	42.0000	
14-JAN-2007 09:57 CHK	39.9000	Be Ac
14-JAN-2007 10:21 CHK	42.6000	In
15-JAN-2007 05:03 CHK	41.3000	
16-JAN-2007 06:18 CHK	41.6000	
17-JAN-2007 04:55 CHK	40.8000	In
18-JAN-2007 06:08 CHK	39.3000	Be Ac
18-JAN-2007 06:35 CHK	42.6000	In
19-JAN-2007 05:52 CHK	39.4000	Be Ac
19-JAN-2007 06:18 CHK	41.4000	
22-JAN-2007 05:09 CHK	41.3000	
22-JAN-2007 05:33 CHK	No Value	
23-JAN-2007 05:04 CHK	<b>~</b> 41.9000	
24-JAN-2007 06:08 CHK /	<b>≯</b> 1.1000	
25-JAN-2007 05:40 CHK	42.0000	
26-JAN-2007 06:11 CHK	41.3000	
26-JAN-2007 06:33 CHK	No Value	
27-JAN-2007 07:37 CHK	42.1000	
Quality Assurance Multi-Test Full Reno	rt (continued)	Pac

Quality Tibbulance intain Test I am Report (commutal)	Quality Assurance	Multi-Test Full	Report (continued	Page: 3
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Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
29-JAN-2007 05:13	СНК	42.0000		<del></del>
30-JAN-2007 05:21	CHK	38.8000	Be Ac	1
30-JAN-2007 05:44	CHK	41.8000	- 1 أ [ أ	•
31-JAN-2007 05:13	CHK	41.7000	iii	
1-FEB-2007 05:05	CHK	41.4000		
1-FEB-2007 05:32	CHK	No Value		

2-FEB-2007 05:09 CHK 41.8000 | | | 3-FEB-2007 10:57 CHK 41.3000 | | |

#### -- Multi-Test Full Report --

Description : Quad10C (Hex 3) alpha %Eff

Parameter Units: Parameter Type: Generic

---- Lower/Upper Bounds Test Parameters ----

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 46.962921 Std Deviation : 0.670843

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
1-JAN-2007 11:32	СНК	49.2000	Ab Ac	 
1-JAN-2007 11:57	CHK	49.3000	Ab Ac	
2-JAN-2007 04:55	CHK	48.1000		
3-JAN-2007 06:18	CHK	49.3000	Ab Ac	
3-JAN-2007 06:40	CHK	48.5000	In	
4-JAN-2007 05:38	CHK	48.1000		
5-JAN-2007 05:33	CHK	48.6000	In	
6-JAN-2007 06:35	CHK	48.7000	In	
8-JAN-2007 05:06	CHK	48.3000	111	
9-JAN-2007 04:59	CHK	48.2000	111	
9-JAN-2007 05:26	CHK	No Value		
10-JAN-2007 05:20	CHK	48.8000	In	
11-JAN-2007 05:57	CHK	48.4000	In	
11-JAN-2007 06:20	CHK	No Value		
12-JAN-2007 05:30	CHK	48.6000	In	
13-JAN-2007 06:09	CHK	48.6000	In	
13-JAN-2007 06:33	CHK	No Value		
14-JAN-2007 09:57	CHK	48.3000		
14-JAN-2007 10:21	CHK	No Value		
15-JAN-2007 05:03	CHK	46.6000		
16-JAN-2007 06:18	CHK	48.4000	In	
17-JAN-2007 04:55	CHK	48.1000		
18-JAN-2007 06:08	CHK	46.4000	iii	
18-JAN-2007 06:35	CHK	No Value	111	

file:///P /Transfer/qa1_gpc10_6-feb-2007-16044618.txt
19-JAN-2007 05:52 CHK 48.1000
19-JAN-2007 06:18 CHK No Value
22-JAN-2007 05:09 CHK 48.5000  In
22-JAN-2007 05:33 CHK No Value
23-JAN-2007 05:04 CHK 46.3000
24-JAN-2007 06:08 CHK 48.3000
Quality Assurance Multi-Test Full Report (continued) Page: 4
Measurement Time Sample ID Sample Analyst Value LU SD UD BS Rej
25-JAN-2007 05:40 CHK 45.2000  In
26-JAN-2007 06:11 CHK 48.8000  In
26-JAN-2007 06:33 CHK No Value
27-JAN-2007 07:37 CHK 45.6000  In
29-JAN-2007 05:13 CHK 48.5000  In
30-JAN-2007 05:21 CHK 46.6000
30-JAN-2007 05:44 CHK No Value
31-JAN-2007 05:13 CHK 48.2000
1-FEB-2007 05:05 CHK 48.5000  In
1-FEB-2007 05:32 CHK No Value
2-FEB-2007 05:09 CHK 48.5000  In
3-FEB-2007 10:57 CHK 48.0000
Multi-Test Full Report
Description : Quad10D (Mex 4) alpha %Eff Parameter Units : Parameter Type : Generic
Lower/Upper Bounds Test Parameters Lower Bound : 46.299999 Upper Bound : 50.000000
Investigate Level: 2.000000 Action Level: 3.000000
Sample Driven N-Sigma Test Parameters Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00 Mean : 48.150002 Std Deviation : 0.600698
Measurement Time Sample ID Sample Analyst Value LU SD UD BS Re
1-JAN-2007 11:32 CHK 48.1000
1-JAN-2007 11:57 CHK No Value
2-JAN-2007 04:55 CHK 48.0000
3-JAN-2007 06:18 CHK 48.7000

3-JAN-2007 06:40 (	CHK	No Value	111
4-JAN-2007 05:38 (	CHK	48.0000	
5-JAN-2007 05:33 (	CHK :	48.6000	i i i
6-JAN-2007 06:35 (	CHK	47.8000	İİİ
8-JAN-2007 05:06 (	CHK	47.5000	İİİ
9-JAN-2007 04:59 (	CHK	47.6000	iii
9-JAN-2007 05:26 (	CHK	No Value	
10-JAN-2007 05:20	СНК	48.4000	İİİ
11-JAN-2007 05:57	СНК	48.4000	iii
11-JAN-2007 06:20	СНК	No Value	
12-JAN-2007 05:30	CHK	48.4000	
13-JAN-2007 06:09	CHK	48.7000	İİİ
13-JAN-2007 06:33	CHK	No Value	
14-JAN-2007 09:57	CHK .	47.9000	
14-JAN-2007 10:21	CHK	No Value	
15-JAN-2007 05:03	CHK	48.0000	
16-JAN-2007 06:18	CHK	47.8000	iii
17-JAN-2007 04:55	CHK	48.5000	iii
18-JAN-2007 06:08	CHK	47.6000	İİİ
18-JAN-2007 06:35	CHK	No Value	
19-JAN-2007 05:52	CHK	47.9000	
19-JAN-2007 06:18	CHK	No Value	
Quality Assurance M	ulti Tost Full Donort (ac	entinued)	, , , D

Quality Assurance Multi-Test Full Report (continued) Page : 5

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
22-JAN-2007 05:09	СНК	48.4000		
22-JAN-2007 05:33	CHK	No Value		
23-JAN-2007 05:04	CHK/	A8.0000		
24-JAN-2007 06:08	CHK	47.7000	i i i	
25-JAN-2007 05:40	CHK	47.7000	iii	
26-JAN-2007 06:11	CHK	48.0000	111	
26-JAN-2007 06:33	CHK	No Value		
27-JAN-2007 07:37	CHK	48.4000		
29-JAN-2007 05:13	CHK	47.3000	iii	
30-JAN-2007 05:21	CHK	47.6000	111	
30-JAN-2007 05:44	CHK	No Value		
31-JAN-2007 05:13	CHK	48.7000		•
1-FEB-2007 05:05	CHK	48.2000		
1-FEB-2007 05:32	CHK	No Value		
2-FEB-2007 05:09	CHK	47.9000		
3-FEB-2007 10:57	CHK	48.2000	iii	

```
-- Multi-Test Full Report --
```

Description : Quad QE (Hex 5) alpha %Eff

Parameter Units : Parameter Type : Generic

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 44.799999 Upper Bound : 48.599998

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 46.425556 Std Deviation : 0.531481

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
1-JAN-2007 11:32	СНК	47.5000	In	
1-JAN-2007 11:57	CHK	No Value		
2-JAN-2007 04:55	CHK	47.7000	In	
3-JAN-2007 06:18	CHK	48.0000	In	
3-JAN-2007 06:40	CHK	No Value		
4-JAN-2007 05:38	CHK	47.7000	In	
5-JAN-2007 05:33	CHK	46.6000		
6-JAN-2007 06:35	CHK	46.8000		
8-JAN-2007 05:06	CHK	47.2000		
9-JAN-2007 04:59	CHK	48.1000	Ac	
9-JAN-2007 05:26	CHK	47.3000		
10-JAN-2007 05:20	CHK	47.6000	In	
11-JAN-2007 05:57	CHK	47.7000	In	
11-JAN-2007 06:20	CHK	No Value		
12-JAN-2007 05:30	CHK	47.4000		
13-JAN-2007 06:09	CHK	47.3000		•
13-JAN-2007 06:33	CHK	No Value	111	
14-JAN-2007 09:57	CHK	47.9000	In	
14-JAN-2007 10:21	CHK	No Value	111	
15-JAN-2007 05:03	CHK	47.1000	$\parallel \parallel \parallel$	•
16-JAN-2007 06:18	CHK	47.2000		•
17-JAN-2007 04:55	CHK	47.3000		

Quality Assurance Multi-Test Full Report (continued) Page : 6

Sample Analyst

Value LU|SD|UD|BS Rej

\_\_\_\_\_\_

18-JAN-2007 06:08 CHK 47.5000 |In| |

Sample ID

Measurement Time

18-JAN-2007 06:35	CHK	No Value	
19-JAN-2007 05:52	CHK	47.5000	In
19-JAN-2007 06:18	CHK	No Value	
22-JAN-2007 05:09	CHK	47.7000	In
22-JAN-2007 05:33	CHK	No Value	
23-JAN-2007 05:04	CHK	46.6000	111
24-JAN-2007 06:08	CHK	46.9000	
25-JAN-2007 05:40	CHK	47.4000	
26-JAN-2007 06:11	CHK	47.1000	
26-JAN-2007 06:33	CHK	No Value	111
27-JAN-2007 07:37	CHK	47.3000	
29-JAN-2007 05:13	CHK	47.7000	In
30-JAN-2007 05:21	CHK	46.8000	
30-JAN-2007 05:44	CHK	No Value	111
31-JAN-2007 05:13	CHK	47.1000	
1-FEB-2007 05:05	CHK	47.7000	In
1-FEB-2007 05:32	CHK	No Value	
2-FEB-2007 05:09	CHK	47.4000	
3-FEB-2007 10:57	CHK	47.1000	

Description : Quad10F (Hex 6) alpha %Eff

Parameter Units: Parameter Type: Generic

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 46.700001 Upper Bound : 50.099998

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 10-JAN-2006 00:00 End Date : 1-MAR-2006 00:00

Mean : 48.417023 Std Deviation : 0.513860

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
1-JAN-2007 11:32	CHK	48.6000		. <b></b>
1-JAN-2007 11:57	CHK	No Value		
2-JAN-2007 04:55	CHK	48.5000		
3-JAN-2007 06:18	CHK	48.5000	ÌÌÌ	
3-JAN-2007 06:40	CHK	No Value		
4-JAN-2007 05:38	CHK	48.3000		
5-JAN-2007 05:33	CHK	48.1000		

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6-JAN-2007 06:35 CHK
                                        48.5000
8-JAN-2007 05:06 CHK
                                        48.5000
9-JAN-2007 04:59 CHK
                                        48.1000
9-JAN-2007 05:26 CHK
                                      No Value
10-JAN-2007 05:20 CHK
                                        48.6000
11-JAN-2007 05:57 CHK
                                        46.7000
11-JAN-2007 06:20 CHK
                                        48.5000
12-JAN-2007 05:30 CHK
                                        48.8000
13-JAN-2007 06:09 CHK
                                        48.6000
13-JAN-2007 06:33 CHK
                                       No Value
14-JAN-2007 09:57 CHK
                                        48.7000
Quality Assurance Multi-Test Full Report (continued)
                                                      Page: 7
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Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
1VI Cabai Cilicite I IIIIC	Dainpie 115	Dampie I maryst	v arac	

14-JAN-2007 10:21 CHK	No Value
15-JAN-2007 05:03 CHK	48.4000
16-JAN-2007 06:18 CHK	48.3000
17-JAN-2007 04:55 CHK	48.5000
18-JAN-2007 06:08 CHK	48.6000
18-JAN-2007 06:35 CHK	No Value
19-JAN-2007 05:52 CHK	49.0000
19-JAN-2007 06:18 CHK	No Value
22-JAN-2007 05:09 CHK	45.4000 Be Ac
22-JAN-2007 05:33 CHK	48.1000
23-JAN-2007 05:04 CHK	<b>4</b> 8.2000
24-JAN-2007 06:08 CHK	48.4000
25-JAN-2007 05:40 CHK	47.7000
26-JAN-2007 06:11 CHK	45.8000 Be Ac
26-JAN-2007 06:33 CHK	45.4000 Be Ac
27-JAN-2007 07:37 CHK	48.5000
29-JAN-2007 05:13 CHK	47.7000
30-JAN-2007 05:21 CHK	48.5000
30-JAN-2007 05:44 CHK	No Value
31-JAN-2007 05:13 CHK	48.7000
1-FEB-2007 05:05 CHK	45.3000 Be Ac
1-FEB-2007 05:32 CHK	48.6000
2-FEB-2007 05:09 CHK	48.8000
3-FEB-2007 10:57 CHK	48.5000

Quality Assurance Report.

Generated 6-FEB-2007 16:04:44.89

QA Filename : \$DISK1:[QUAD10.QA]BKG\_15.QAF;2

Description : Quad10A (Hex 1) alph bkg

Parameter Units : cpm Parameter Type : Generic

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 0.046053 Std Deviation : 0.013942

	-	Sample Analyst	Value	LU SD UD BS Rej
1-JAN-2007 20:50	BKG	0.0400		<b></b>
3-JAN-2007 05:54	BKG	0.0400	İİİ	
4-JAN-2007 05:16	BKG	0.0600	İİİ	
5-JAN-2007 05:10	BKG	0.0400	iii	
6-JAN-2007 04:58	BKG	0.0500	İİİ	
6-JAN-2007 20:41	BKG	0.0500		
7-JAN-2007 20:16	BKG	0.0600		
9-JAN-2007 04:05	BKG	0.0500		
10-JAN-2007 04:57	BKG	0.0500		
11-JAN-2007 05:34	BKG	0.0300		
12-JAN-2007 05:06	BKG	0.0400		
12-JAN-2007 21:56	BKG	0.0200		
12-JAN-2007 21:56	BKG	0.0200		
13-JAN-2007 10:06	BKG	0.0700		
13-JAN-2007 21:22	BKG	0.0400		
14-JAN-2007 22:18	BKG	0.0500		
16-JAN-2007 05:55	BKG	0.0400		
17-JAN-2007 04:33	BKG	0.0600		
18-JAN-2007 05:44	BKG	0.0400		
19-JAN-2007 04:34	BKG	0.0700		
20-JAN-2007 04:42	BKG	0.0500		
20-JAN-2007 20:26	BKG	0.0500		
21-JAN-2007 20:59	BKG	0.0400		
23-JAN-2007 04:15	BKG/	0.0500		
24-JAN-2007 05:45	BKG/	0.0300		
25-JAN-2007 05:17	BKG	0.0400		
26-JAN-2007 05:49	BKG	0.0500		
27-JAN-2007 05:03	BKG	0.0400		

27-JAN-2007 21:10 BKG	0.0400
28-JAN-2007 21:42 BKG	0.0400
30-JAN-2007 04:58 BKG	0.0500
31-JAN-2007 04:27 BKG	0.0500
1-FEB-2007 04:14 BKG	0.0500
2-FEB-2007 04:22 BKG	0.0600
3-FEB-2007 03:19 BKG	0.0500
3-FEB-2007 23:10 BKG	0.0800  In
4-FEB-2007 21:35 BKG	0.0600

Description : Quad 10B (Hex 2) alpha bkg

Parameter Units : cpm Parameter Type : Generic

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 0.033122 Std Deviation : 0.010930

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

\_\_\_\_\_

Quality Assurance Multi-Test Full Report (continued) Page: 2

		'		
Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
1-JAN-2007 20:50	BKG	0.0300		· <b></b>
3-JAN-2007 05:54	BKG	0.0300	111	
4-JAN-2007 05:16	BKG	0.0400		
5-JAN-2007 05:10	BKG	0.0200	ÌÌÌ	
6-JAN-2007 04:58	BKG	0.0400	111	
6-JAN-2007 20:41	BKG	0.0400	ÌÌÌ	
7-JAN-2007 20:16	BKG	0.0300	iii	
9-JAN-2007 04:05	BKG	0.0200		
10-JAN-2007 04:57	BKG	0.0300		
11-JAN-2007 05:34	BKG	0.0300	iii	
12-JAN-2007 05:06	BKG	0.0400	iii	
12-JAN-2007 21:56	BKG	0.0400	ÌÌÌ	
12-JAN-2007 21:56	BKG	0.0400	İİİ	
13-JAN-2007 10:06	BKG	0.0400	iii	
13-JAN-2007 21:22	BKG	0.0400	iii	
14-JAN-2007 22:18	BKG	0.0300	iii	

16-JAN-2007 05:55 BKG 0.0400	1
17-JAN-2007 04:33 BKG 0.0300	1
18-JAN-2007 05:44 BKG 0.0300	1
19-JAN-2007 04:34 BKG 0.0400	
20-JAN-2007 04:42 BKG 0.0200	
20-JAN-2007 20:26 BKG 0.0200	1
21-JAN-2007 20:59 BKG 0.0200	ĺ
23-JAN-2007 04:15 BKG 0.0200	
24-JAN-2007 05:45 BKG 0.0200	ĺ
25-JAN-2007 05:17 BKG 0.0200	Ì
26-JAN-2007 05:49 BKG 0.0100  In	Ĥ
27-JAN-2007 05:03 BKG 0.0300	
27-JAN-2007 21:10 BKG 0.0200	ĺ
28-JAN-2007 21:42 BKG 0.0200	ĺ
30-JAN-2007 04:58 BKG 0.0300	ĺ
31-JAN-2007 04:27 BKG 0.0300	
1-FEB-2007 04:14 BKG 0.0500	
2-FEB-2007 04:22 BKG 0.0300	
3-FEB-2007 03:19 BKG 0.0100  In	1
3-FEB-2007 23:10 BKG 0.0400	
4-FEB-2007 21:35 BKG 0.0400	ĺ

Description : Quad 10C (Hex 3) alpha bkg

Parameter Units : cpm / Parameter Type : Generic

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 0.036349 Std Deviation : 0.011573

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

6-JAN-2007 04:58 BKG	0.0300	
6-JAN-2007 20:41 BKG	0.0200	
7-JAN-2007 20:16 BKG	0.0300	$\prod_{i=1}^{n} 1$
9-JAN-2007 04:05 BKG	0.0400	
10-JAN-2007 04:57 BKG	0.0600	In
11-JAN-2007 05:34 BKG	0.0300	111
12-JAN-2007 05:06 BKG	0.0400	
12-JAN-2007 21:56 BKG	0.0000	Ac
12-JAN-2007 21:56 BKG	0.0000	Ac
13-JAN-2007 10:06 BKG	0.0500	
13-JAN-2007 21:22 BKG	0.0400	
14-JAN-2007 22:18 BKG	0.0400	
16-JAN-2007 05:55 BKG	0.0500	111
17-JAN-2007 04:33 BKG	0.0500	
18-JAN-2007 05:44 BKG	0.0400	
19-JAN-2007 04:34 BKG	0.0600	In
20-JAN-2007 04:42 BKG	0.0700	In
20-JAN-2007 20:26 BKG	0.0300	
21-JAN-2007 20:59 BKG	0.0400	
23-JAN-2007 04:15 BKG	0.0500	
24-JAN-2007 05:45 BKG	0.0400	
25-JAN-2007 05:17 BKG	0.0600	In
26-JAN-2007 05:49 BKG	0.0400	
27-JAN-2007 05:03 BKG	0.0500	
27-JAN-2007 21:10 BKG	0.0400	
28-JAN-2007 21:42 BKG	0.0400	
30-JAN-2007 04:58 BKG	0.0300	111
31-JAN-2007 04:27 BKG	0.0700	In
1-FEB-2007 04:14 BKG	0.0600	In
2-FEB-2007 04:22 BKG	0.0600	In
3-FEB-2007 03:19 BKG	0.0500	
3-FEB-2007 23:10 BKG	0.0500	
4-FEB-2007 21:35 BKG	0.0500	

Description : Quad 10D (Hex 4) alpha bkg

Parameter Units : cpm / Parameter Type : Generic

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean

: 0.041587

Std Deviation: 0.010848

         Page : 4
ue LU SD UD BS Rej

```
file:///P//Transfer/qa1_gpc10_6-feb-2007-16044618.txt
                                          0.0300 | | |
3-FEB-2007 23:10 BKG
4-FEB-2007 21:35 BKG
                                          0.0400 | | |
-- Multi-Test Full Report --
              : Quad10E (Hex 5) alpha bkg
Description
                             Parameter Type: Generic
Parameter Units: cpm
Investigate Level: 2.000000
                              Action Level: 3.000000
  ---- Sample Driven N-Sigma Test Parameters ----
            : 1-JUL-2005 00:00 End Date
Start Date
                                           : 1-JAN-2006 00:00
Mean
            : 0.028421
                           Std Deviation: 0.011712
Measurement Time
                  Sample ID
                                Sample Analyst
                                                 Value LU|SD|UD|BS Rej
1-JAN-2007 20:50 BKG
                                          0.0500
3-JAN-2007 05:54 BKG
                                          0.0300
4-JAN-2007 05:16 BKG
                                          0.0500
5-JAN-2007 05:10 BKG
                                          0.0300
6-JAN-2007 04:58 BKG
                                          0.0500
6-JAN-2007 20:41 BKG
                                          0.0500
7-JAN-2007 20:16 BKG
                                          0.0300
9-JAN-2007 04:05 BKG
                                          0.0500
10-JAN-2007 04:57 BKG
                                          0.0500
11-JAN-2007 05:34 BKG
                                          0.0500
12-JAN-2007 05:06 BKG
                                          0.0600
                                                  |In|
12-JAN-2007 21:56 BKG
                                          0.0800
                                                  |Ac| |
Quality Assurance Multi-Test Full Report (continued)
                                                        Page: 5
                   Sample ID
Measurement Time
                                Sample Analyst
                                                  Value LU|SD|UD|BS Rej
12-JAN-2007 21:56 BKG
                                          0.0800
                                                  |Ac| |
13-JAN-2007 10:06 BKG
                                          0.0400
13-JAN-2007 21:22 BKG
                                          0.0500
14-JAN-2007 22:18 BKG
                                          0.0400
16-JAN-2007 05:55 BKG
                                          0.0400
17-JAN-2007 04:33 BKG
                                          0.0500
18-JAN-2007 05:44 BKG
                                          0.0600
                                                  |In|
19-JAN-2007 04:34 BKG
                                          0.0500
20-JAN-2007 04:42 BKG
                                          0.0300
20-JAN-2007 20:26 BKG
                                          0.0400
21-JAN-2007 20:59 BKG
                                          0.0300
```

23-JAN-2007 04:15	BKG	0.0700	Ac
24-JAN-2007 05:45	BKG	0.0600	In
25-JAN-2007 05:17	BKG	0.0400	111
26-JAN-2007 05:49	BKG	0.0400	
27-JAN-2007 05:03	BKG	0.0500	
27-JAN-2007 21:10	BKG	0.0400	111.
28-JAN-2007 21:42	BKG	0.0300	
30-JAN-2007 04:58	BKG	0.0200	+
31-JAN-2007 04:27	BKG	0.0600	In
1-FEB-2007 04:14	BKG	0.0300	
2-FEB-2007 04:22	BKG	0.0800	Ac
3-FEB-2007 03:19	BKG	0.0500	
3-FEB-2007 23:10	BKG	0.0500	
4-FEB-2007 21:35	BKG	0.0400	

Description : Quad10F (Hex 6) alpha bkg

Parameter Units : cpm / Parameter Type : Generic

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 0.013053 Std Deviation : 0.032288

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
1-JAN-2007 20:50	BKG	0.0500		
3-JAN-2007 05:54	BKG	0.0700	111	
4-JAN-2007 05:16	BKG	0.0500	111	
5-JAN-2007 05:10	BKG	0.0300	111	
6-JAN-2007 04:58	BKG	0.0500	i i i	
6-JAN-2007 20:41	BKG	0.0600	111	
7-JAN-2007 20:16	BKG	0.0600	111	
9-JAN-2007 04:05	BKG	0.0400	111	
10-JAN-2007 04:57	BKG	0.0400		
11-JAN-2007 05:34	BKG	0.0400		
12-JAN-2007 05:06	BKG	0.0300		
12-JAN-2007 21:56	BKG	0.1200	Ac	
12-JAN-2007 21:56	BKG	0.1200	Ac	
13-JAN-2007 10:06	BKG	0.0600		
13-JAN-2007 21:22	BKG	0.0500		

14-JAN-2007 22:18 BKG

0.0400 | | |

Quality Assurance Multi-Test Full Report (continued)

Page: 6

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
16-JAN-2007 05:55		0.0500		
17-JAN-2007 04:33		0.0400		•
18-JAN-2007 05:44 19-JAN-2007 04:34		0.0400 0.0500		
20-JAN-2007 04:42		0.0300	1 1 1	
20-JAN-2007 20:26		0.0500		
21-JAN-2007 20:59		0.0300		,
23-JAN-2007 04:15		0.0400		
24-JAN-2007 05:45	BKG/	0.0400	iii	
25-JAN-2007 05:17	BKG	0.0300	iii	
26-JAN-2007 05:49	BKG	0.0400	İİİ	
27-JAN-2007 05:03	BKG	0.0600		
27-JAN-2007 21:10		0.0400		
28-JAN-2007 21:42		0.0300		
30-JAN-2007 04:58		0.0400		
31-JAN-2007 04:27		0.0400		
1-FEB-2007 04:14		0.0400		
2-FEB-2007 04:22		0.0300		
3-FEB-2007 03:19		0.0300		
3-FEB-2007 23:10		0.0300		
4-FEB-2007 21:35	RKA	0.0400		

### RADIUM 228

### SAMPLE AND QC DATA

TRENT STL	Data Review/Verification Checklist	2/2/2007 5	5:16:19	€ PM
ot No., Due Date:	RADIOCHEMISTRY, First Level Review  J7A090287,J7A100115,J7A100118; 02/06/2007			
ent, Site:	536403; AIR MONITORING Yerington Mine			
•	st: 7029198; RRA228 Ra-228 by GPC			
G, Matrix:	33442,33443,33444; FILTER			
COC is the ICOC page complete	e; includes all applicable analysis, dates, SOP numbers, and revisions?	<b>多性時間</b>	Yeş N	o N/
QC Batch Do the Summary/Detailed	Reports include a calculated result for each sample listed on the QC Batch She	et?	Yey N	lo N/
Are the QC appropriate for	the analysis included in the batch?		Yes N	o N/
Is the Analytical Batch Wor	rksheet complete; includes as appropriate, volumes, count times, etc?		Yes N	lo N/
Does the Worksheets inclu	ide a Tracer Vial label for each sample?	- ,	Yes N	o N/
QC & Samples Is the blank results, yield, a	and MDA within contract limits?	學是被	Yes N	o N
Is the LCS result, yield, and	d MDA within contract limits?		Yes N	io N/
Are the MS/MSD results, y	ields, and MDA within contract limits?		Yes N	o N/
Are the duplicate result, yie	elds, and MDAs within contract limits?		Yes N	io N/
Are the sample yields and	MDAs within contract limits?		Yeş N	o N/
Raw Data Were results calculated in	the correct units?		Yeş N	lo N/
Were analysis volumes en	tered correctly?		Yes N	lo N/
Were Yields entered correct	ctlý?		Yes N	io N/
Were spectra reviewed/me	et contractual requirements?		Yes N	io N/
Were raw counts reviewed	for anomalies?		Yes N	io N/
Other Are all nonconformances in	的		Yes N	lo N
Are all required forms filled	out?		Yes N	lo N/
Was the correct methodolo	ogy used?		Yes N	lo N
Was transcription checked	?		Yes N	io N
Were all calculations check	ked at a minimum frequency?		Yes N	io N
Are worksheet entries con	plete and correct?		Yes N	lo N
Comments on any No resp See NCM 10-09399.	onse:			
See NCM 10-09399.	3 La La La La La La La La La La La La La	10/07		

QAS\_RADCALCV4.8.26 STL RICHLAND

STL Richland

Page 1



#### Data Review Checklist RADIOCHEMISTRY Second Level Review

OC Batch Number:	7029198
OC Batch Number:	100/1/0

A. Sample Analysis  1. Are the sample yields within acceptance criteria?  2. Is the sample Minimum Detectable Activity < the Contract  Detection Limit?  3. Are the correct isotopes reported?			
2. Is the sample Minimum Detectable Activity < the Contract Detection Limit?		i	
Detection Limit?		i	
3. Are the correct isotopes reported?		<u> </u>	<u>.                                    </u>
B. QC Samples			
<ol> <li>Is the Minimum Detectable Activity for the blank result ≤ the</li> </ol>		1	
Contract Detection Limit?			
2. Does the blank result meet the Contract criteria?	1	<u> </u>	
3. Is the blank result < the Contract Detection Limit?	/.		
4, Is the blank result > the Contract Detection Limit but the sample	1	ĺ	
result < the Contract Detection Limit?			
5. Is the LCS recovery with contract acceptance criteria?			
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection		1	
Limit?			
8. Do the MS/MSD results and yields meet acceptance criteria?			
9. Do the duplicate sample results and yields meet acceptance		Ī	
criteria?			
C. Other			
1. Are all Nonconformances included and noted?			
2. Are all required forms filled out?			
3. Was the correct methodology used?			
4. Was transcription checked?			
5. Were all calculations checked at a minimum frequency?			
6. Were units checked?			
Comments on any "No" response: See NCm			

Second Level Review Skerryl a Chlam. Date: 2-4-07

1/29/2007 2:13:06 PM			Sample Prep	e Preparation/Analysis	ilysis		Balance	Balance 1d:1120373922,1120403183	120403183
536403, Brown and Caldwell Caldwell	, Brown &	BX Ra-226/228 Prp TF Radium-228 bv	BX Ra-226/228 PrpRC5016, TF Radium-228 by GPC	RC5016, SepRC5005 GPC			Pipet #:	#1	
AnalyDueDate: 02/05/2007		01 STAND	STANDARD TEST SET				Sep1 DT/Tm Tech: ×	ンプ	3067 8.41
<b>Batch: 7029198 FILTER</b> SEO Batch, Test: 7011225, BXTE	PM, Quote: SA, 63174 All Tests: 7011219 9NS1, 7011221 BAS7, 7011225 BXTE, 7011229 BXTF, 70	VS1, 7011221 B	PM, Q AS7, 7011225 BXT	PM, Quote: SA, 631 225 BXTE, 7011229 BXTF	, <b>63174</b> BXTF, 7029198 BXTF		Sep2 DT/Tm Tech:' Prep Tech;	FITM Tech: $\bigcirc + \bigcirc + \bigcirc + \bigcirc + \bigcirc + \bigcirc + \bigcirc + \bigcirc + \bigcirc + \bigcirc $	1/07 = 70% Soon
Work Order, Lot, Total Amt	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	OC Tracer Prep Date		Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 JMK81-2-AD	531.15sa,g	150.35g,in	0.2358g	- BATA25421B	29.42×50	Û	2,983	12:17	
			7.5092			4,	154	2/18/	
		,	1.0081	\		2	Class	3/1/5/2	
12/05/2006 12:25	AmtRec	AmtRec: FILTER	#Containers: 1		a Land (val)	Scr:	Alpha:		Beta:
2 JMLA1-2-AD 0.633sa,g J7A090287-2-SAMP	502.71sa.g	150.45g.in	0.2493g 8,335		28.9	>)	0%53	12803	
			7. 4901			2/3	1861	21.60	4 4 5 1 1 1 1 1 5 5 6 6 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
			1,1128			X	cho	Julas	
12/05/2006 12:10	AmtRec	AmtRec: FILTER	#Containers: 1			Scr.	Alpha:		Beta:
3 JMLA4-2-AD 0:833sa,g J7A090287-3-SAMP	516.54sa,g	150.04g,in	7,468	RATA25423 01/10/07	30.3	<i>^5</i> 9	67.43	1/3/1/2>	
			7, 4901			57	1457	\01/e	
<del>,</del>			.9970			70	droj	3405	
12/05/2006 12:45	AmtRec	AmtRec: FILTER	#Containers: 1			Scr.	Alpha:		Beta:
4 JMLA7-2-AD 0.833sa,g J7A090287-4-SAMP	519.32sa,g	150.04g,in	7,276	PATA25433 01/10/07	7.67	<i>c</i> 9	h160	13.00	
			7.5092			5	1861	3/6/57	
			.96896.			<i>S</i> 3	ÓωS)	2/1/02	
12/05/2006 12:30	AmtRec	AmtRec: FILTER	#Containers: 1	-		Scr:	Alpha:		Beta:
				— <i>-</i> >-		<del>~`</del> >			
STL Richland Key. In - Initial Amt, Richland Wa od - Preo Dt r	In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 od - Preo Dt - r - Reference Dt. ec-Enichment Cell. ct-Cocktail	Diluted Amt, s1 -	- Sep1, s2 - Sep2	Page 1	ISV - Ins	ISV - Insufficient Volume for Analysis	for Analysis	Prep	WO Cnt: 4 Prep SamplePrep v4.8.26
		> :::::::::::::::::::::::::::::::::::::							

1/29/2007 2:13:08 PM		Sample Preparation/Analysis	ion/Analy	sis		Balance	Balance (d:1120373922,1120373922,1120	120373922,1120
536403, Brown and Caldwell Caldwell	Brown & BX Ra-226/228 F TF Radium-228	BX Ra-226/228 PrpRC5016, SepRC5005 TF Radium-228 by GPC	C2002			Pipet #:	t#:	
	01 STAN	01 STANDARD TEST SET				Sep1 DT/Tm Tech:	ch:	
Batch: 7029198 FILTER	pCi/sampl	PM, Quote:	PM, Quote: SA, 63174			Sep2 DT/Tm Tech:	c <b>h</b> :	
						Prep Te	Prep Tech: WoodT, HarrisonJ	Puos
Work Order, Lot, Total Amt Sample Date / /Unit	Total Initial Aliquot Acidified/Unit Amt/Unit	Amt dified)	<b> </b> -	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
<b>5 JMLA8-2-AD</b> 0.833sa,g J7A090287-5-SAMP	500.78sa.g 150.17g.in	0.2498g	RATA25424 1 1 01/10/07	28 16 3×5C	) (2	1560	1/3JB >	
		7,432			0	1521	~1/1/E	
		1.05791			Ĵ	OU 6)	3/8/03	
12/05/2006 12:50	AmtRec: FILTER	#Containers: 1			Scr.	Aipha:		Beta:
6 JMLT2-2-AD 0.833sa,g J7A100115-1-SAMP	524.49sa,g 150.14g,in	0.2385g RAI	01/10/07	000	) J)	hs 69	1/200-	
		1 2bbh 'L			3/2	136/	01,60,	
		,9283			9	Chas	3/2/p>	
12/11/2006 11:40	AmtRec: FILTER	#Containers: 1		The same of the sa	Scr:	Alpha:		Beta:
7 JMLT6-2-AD 0.833sa,g J7A100115-2-SAMP	532.31sa,g 150.39g,in	0.2353g RAT	RATA25426 01/10/07	06	6.6	(1) 97	1/38/03	
		7,4711			38	75	21/1/2	
		1.0668			3/2	ars	<i>حالكال</i>	
12/11/2006 12:00	AmtRec: FILTER	#Containers: 1			Sor	Alpha:	-	Beta:
8 JMLT7-2-AD 0.833sa,g J7A100115-3-SAMP	527.80sa,g 150.19g,in	0.2379 RAT	RATA25427 01/10/07	292	)	101	ARRAY	,
		7,4901			36	1987	2/03	
		,9291			35	O <b>b</b> I)	rstelle	
12/11/2006 12:15	AmtRec: FILTER	#Containers: 1	$\rightarrow$		Scr.	Alpha:		Beta:
						,		
STL Richland Key. In - Initial Amt.	In - Initial Amt. fi - Final Amt, di - Diluted Amt, st - Sept, s2 - Sep2	1 - Sep1, s2 - Sep2 Page 2	.2	ISV - Ins	ISV - Insufficient Volume for Analysis	for Analysis	V	WO Cnt: 8 Prep SamplePrep v4.8.26
						\\ \tag{\tau}		

1/29/2007 2:13:08 PM			Sample Preparation/Analysis	ration/Ana	Ivsis		Balancia	14:44002730004	100272001
100.400 been moved 0.0000	0	2			206		Dalalice	Dalaile II.     203/3922,     203/3922,     20	120373922,1120
Caldwell	, Brown &	BX Ha-226, TF Radium	BX Ha-226/228 PrpRC5016, SepRC5005 TF Radium-228 by GPC	SepRC5005			Pipe	Pipet #:	
AnalyDueDate: 02/05/2007		01 STANDARD 1	ARD TEST SET				Sep1 DT/Tm Tech:	ch:	
Batch: 7029198 FILTER	pCi/sampl	_	PM, Qu	PM, Quote: SA, 63174	74		Sep2 DT/Tm Tech:	ch:	
AND							Prep Te	Prep Tech: WoodT,HarrisonJ	sond
Work Order, Lot, Total Amt Sample Date /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date		Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
<b>9 JMLT8-2-AD</b> 0.833sa,g J7A100115-4-SAMP	503.04sa,g	150.15g,in	7,163-	RATA25428 ("	, 30.9 3x50.64	x50 69	(e)	1/3902	
			7,4234			1 30	78h/	2/1/00	
			. 9649.			36	Ord	2/2/0>	
12/11/2006 11:45	AmtRe	AmtRec: FtLTER	#Containers: 1			Scr.	Apha:	,	Beta:
10 JMLVA-2-AD 0.833g J7A100115-5-SAMP	511.47g	150.13g,in	0.2445g 7 819	RATA25429 01/10/07	27.4	(2)	ر کی:	1,03	
			7.4/6/6			4	100/	3/20/20	
			1.0479			Th.	JU)	Jako.	
12/11/2006 12:20	AmtRe	AmtRec: FiLTER	#Containers: 1			Scr.	Alpha:		Beta:
11 JMLVW-2-AD 0.833g	502.79g	150.13g,in	0.2487g	RATA25430 01/10/07	1 4 6	77	(	/2/2/,	
			106/7 -		50' r	875	100	2/1/0-	
			1.0085	\		SF	Jes	Sofel	
12/13/2006 12:10	AmtRe	AmtRec; FILTER	#Containers: 1	Mod Accompany		Scr.	Alpha:	:	Beta:
12 JMLV3-2-AD 0.833sa,g J7A100118-2-SAMP	507.51sa,g	150.08g.in	0.2463g	RATA25431 01/10/07	28.9	7 /	J.K.P.	26/27/	
			7, 4379			5	25/	21,10	
			1,00800			3	(Jed)	Softer.	
12/13/2006 12:43	AmtRe	AmtRec: FILTER	#Containers: 1	7		Scr.	Alpha:		Beta:
				•			•		
	· 1	,							
STL Richland Key: In • Initial Amt, Richland Wa. pd • Prep Dt, r	In Initial Amt, fir Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 pd - Prep Dt, r. Reference Dt, ec-Enrichment Cell, ct-Cocktailed Added	- Diluted Amt. st - Enrichment Çell, c		Page 3	ISV - In	ISV - Insufficient Volume for Analysis	for Analysis	V Prep	WO Cnt: 12 Prep_SamplePrep v4.8.26
4							\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\		

1/29/2007 2:13:09 PM			Sample Preparation/Analysis	aration/Ana	lysis		Balance	Balance Id:1120373922,1120373922,1120	1120373922,1120
536403, Brown and Caldwell Caldwell	, Brown &	BX Ra-226 TF Radium	BX Ra-226/228 PrpRC5016, SepRC5005 TF Radium-228 by GPC	SepRC5005			Pip	Pipet #:	
AnalyDueDate: 02/05/2007		01 STANDARD T	ARD TEST SET				Sep1 DT/Tm Tech:	ech:	
Batch: 7029198 FILTER SEO Batch Test: 7011225 BXTE	pCi/sampl	_	PM, Q	PM, Quote: SA, 63174	74		Sep2_DT/Tm Tech:	ech:	
							Prep T	Prep Tech: WoodT,HarrisonJ	lsonJ
Work Order, Lot, Total Amt Sample Date /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer   Prep Date	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
13 JMLV5-2-AD 0.833sa,g J7A100118-3-SAMP	510.86sa,g	150.11g,in	0.2448g	RATA25432 } .	30,03xS	3,450-9;	JU/	1/2,005	
			7, 4996	1		9	1811	501/e	
			1,0641	7		ah	O (2007)	56/2/2	
12/13/2006 13:15	AmtRe	AmtRec: FILTER	#Containers: 1			Scr.	Alpha:		Beta:
0.833sa,g J7A100118-4-SAMP	504.92sa,g	150.33g,in	0.2489	RATA25434 01/10/07	1,20,0	32005	Bl.	1/20/21	
			7,4399		1	411	5162	131107	4
			1.052			48	18K1 -	501/1/c	***************************************
12/13/2006 13:18	AmtRe	AmtRec: FILTER	#Containers: 1			Scr.	Apha:	20/6/6	Beta:
15 JMLV9-2-AD 0.833sa,g J7A100118-5-SAMP	511.81sa,g	150.39g,in	7,953	RATA25435 01/10/07	31.2	67	C04"	1/3/30)	
			7,4996	,		ZZZ	78/21	2/1/6 Z	
			1,0605	,		25	5 (GoS)	Solo	
12/13/2006 13:21	AmtRe	AmtRec: FILTER	#Containers: 1			Scr.	Alpha:		Befa:
16 JMN9F-2-AA-B / J7A110000-229-BLK		150.23g,in	150.23g /	RATA25436 01/10/07	3.05	(1)	U'''	1000	
			7.4616			-	75%	5/1/6	
			1.1132			35	1 (JBS)	Calel	
12/05/2006 12:25	AmtRec		#Containers: 1		_	VScr.	Alpha:	,	Beta:
									:
Key:	mt. fi - Final Amt, di - Diluted Amt, s1 - Sep1,	Diluted Amt, s1	- Sept. s2 - Sep2	Page 4	ISV - In	ISV - Insufficient Volume for Analysis	for Analysis	<u>a</u>	WO Cnt: 16 Pren SamplePren v4 8 26
Hichland Wa. pd - Prep Dr	pa · Prep Ut. 1 · Reterence Ut, ec-Enrichment Ceil, ct-Cocktailed Added	- nachment Cell,	ct-Cocktalled Added						Joan pleriep v4.0.

		BX Ra-22	BX Ba-226/228 ProBC5016. SepBC5005	728 PrpRC5016 SepBC5005				770000000000000000000000000000000000000	
				000000000000000000000000000000000000000			oid	Pipet #:	
AnalyDueDate: 02/05/2007		TF Radiu 01 STAN	TF Radium-228 by GPC 01 STANDARD TEST SET				Sep1 DT/Tm Tech:	ech:	
	pCi/sampl	ldı					Sep2 DT/Tm Tech:	ech:	
							Prep T	Prep Tech: ,HarrisonJ	
Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	OC Tracer Prep Date	J		Count On Off (24hr) Circle	CR Analyst, Init/Date	Comments:
		150.01g,in	7,439	RASC4328 01/11/07	29.93xSGK	>9&	C(1/1)	138/20	
			7.4982	2		CS	14.27	2/1605	
			992	\ \ \		Š	iles	2/2/07	
	AmtRec:		#Containers: 1			Scr.	, Alpha:		Beta:
Clients for Batch: 536403, Brown and Caldwell		Brc	Brown & Caldwell		SA, 63174				
Constituent List: RDL: P	pCi/sam LCL:70 pCi/sam LCL:	70 UCL:130	30 RPD:20 RPD:	RA-228	RDL:3.10E+00	00 pCi/sam	m LCL:	UCL:	RPD:
	pci/sam LCL:70 pci/sam LCL:	70 UCL:130 UCL:	30 RPD:20 RPD:	RA-228	RDL:1	pCi/sam	m LCL:	UCL:	RPD:
	pci/sam LCL:70 pci/sam LCL:70	70 UCL:130 70 UCL:130	30 RPD:20 30 RPD:20	Ra-226 RA-228DA	RDL:	pci/sam pci/sam	m LCL:70 m LCL:70	UCL:130 UCL:130	RPD: 20 RPD: 20
: Info: (#s).: 2	Decay to Sabt:	: Y Blk Subt.:	×	Sci.Not.: Y ODR	ODRs: B				
(#s).: 2	Decay to SaDt:	Y Blk	Subt.: N Sci.	Sci.Not.: Y ODR	ODRs: B				٠.
(#s).: 2	Decay to Sabt:	Y B1k	Subt.: N Sci.	Sci.Not.: Y ODRs:	Rs: B				
			٠.	Approved By	Ву			Date:	
Key: In - Initial Amt,		i - Diluted Amt, st	fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2	Page 5	ISV - Inst	ISV - Insufficient Volume for Analysis	for Analysis		WO Cnt: 17

#### Clouseau **Nonconformance Memo**



NCM #: 10-09399

NCM Initiated By: angela long Date Opened: 02/02/2007

Date Closed:

Classification: Anomaly

Status: GLREVIEW

Production Area: Environmental - Prep

Tests: Ra-228 by GPC

Lot #'s (Sample #'s): J7A090287 (1,2,3,4,5),

J7A100115 (1,2,3,4,5), J7A100118 (1,2,3,4,5),

J7A110000 (229), QC Batches: 7011229, 7029198

Nonconformance: Other (describe in detail) Subcategory: Other (explanation required)

#### Problem Description / Root Cause

Name

Date

Description

angela long

02/02/2007

The original batch had a low LCS at 72%, so we re-ran the samples and the results

were good. The batch will be accepted.

#### Corrective Action

Name

**Date** 

Corrective Action

angela long

A re-run was performed and the results are good, so the batch will be accepted. 02/02/2007

#### Client Notification Summary

Client

Project Manager

<u>Notified</u>

Response How Notified

**Note** 

Response

Response Note

#### Quality Assurance Verification

Verified By

**Due Date** 

This section not yet completed by QA.

**Notes** 

#### Approval History

**Date Approved** 

Approved By

**Position** 

Date Printed: 2/2/2007

SDG or Batch Isotope 33442	Rpt Db Id Method RT						n Res				
33442		st Q	LotSample c Analysis Date	Client Id Result	Matrix Cnt Uncert	Recei	ved Date	Sample Da	ate -xpected Yield	Vo	lumes
D 4 000	9JMK8120			P-0812	FILTER	1/8/20	007 10:00:00	12/5/2006	12:25:00 PM		
RA-228	BXTF 1		2/2/2007 6:05:51 AM	1.1531E+00	5.952E-01 5	.952E-01	2.588E+00	PCI/SA	0.862	1.0E+0.	2.358E-
33442	9JMLA120		J7A0902872	P-0813	FILTER	1/8/20	007 10:00:00	12/5/2006	12:10:00 PM		
RA-228	BXTF 1		2/2/2007 6:05:51 AM	4.4305E-01	3.903E-01 4	.778E-01	2.19E+00	PCI/SA	0.935	1.0E+0	2.493E-1
33442	9JMLA420		J7A0902873	P-0814	FILTER	1/8/20	007 10:00:00	12/5/2006	12:45:00 PM		
RA-228	BXTF 1		2/2/2007 6:05:51 AM	8.5941E-01	5.806E-01 5	.806E-01	2.572E+00	PCI/SA	0.878	1.0E+0	2.42E-1
33442	9JMLA720		J7A0902874	P-0815	F!LTER	1/8/20	007 10:00:00	12/5/2006	12:30:00 PM		
RA-228	BXTF 1		2/2/2007 6:06:01 AM	3.2525E-01	4.459E-01 5	.411E-01	2.541E+00	PCI/SA	0.822	1.0E+0	2.407E-
33442	9JMLA820		J7A0902875	000580	FILTER	1/8/20	00:00:00	12/5/2006	12:50:00 PM		
RA-228	BXTF 1		2/2/2007 6:06:01 AM	9.0151E-01	5.005E-01 5	.221E-01	2.304E+00	PCI/SA	0.88	1.0E+0	2.498E-
33443	9JMLT220		J7A1001151	P-0816	FILTER	1/8/20	007 10:00:00	12/11/200	6 11:40:00 AM		
RA-228	BXTF 1		2/2/2007 6:06:01 AM	5.8208E-01	3.816E-01 4	.278E-01	1.937E+00	PCI/SA	0.81	1.0E+0	2.385E-
33443	9JMLT620		J7A1001152	P-0817	FILTER	1/8/20	007 10:00:00	12/11/200	6 12:00:00 PM		
RA-228	BXTF 1		2/2/2007 6:06:10 AM	2,5662E-02	1.11E-01 3	.464E-01	1.741E+00	PCVSA	0.899	1.0E+0	2.353E-
33443	9JMLT720		J7A1001153	P-0818	FILTER	1/8/20	007 10:00:00	12/11/200	6 12:15:00 PM		
RA-228	BXTF 1		2/2/2007 6:06:10 AM	1.7502E+00	4.993E-01 5	.292E-01	2.007E+00	PCI/SA	0.789	1.0E+0	2.37E-1
33443	9JMLT820		J7A1001154	P-0819	FILTER	1/8/20	007 10:00:00	12/11/200	6 11:45:00 AM		
RA-228	BXTF 1		2/2/2007 6:06:10 AM	2.8937E-01	2.893E-01 3	.398E-01	1.614E+00	PCI/\$A	0.867	1.0E+0	2.486E-
33444	9JMLV320		J7A1001182	P-0821	FILTER	1/8/20	007 10:00:00	12/13/200	6 12:43:00 PM		
RA-228	BXTF 1		2/2/2007 6:06:22 AM	8.8132E-01	4.113E-01 4	.164E-01	1.781E+00	PCI/SA	0.847	1.0E+0	2.463E-
33444	9JMLV520		J7A1001183	P-0822	FILTER	1/8/20	007 10:00:00	12/13/200	6 1:15:00 PM		
RA-228	BXTF 1		2/2/2007 6:06:22 AM	4.4957E-01	3.657E-01 3	.715E-01	1.714E+00	PCI/SA	0.928	1.0E+0	2.448E-
33444	9JMLV820		J7A1001184	P-0824	FILTER	1/8/20	007 10:00:00	12/13/200	6 1:18:00 PM		
RA-228	BXTF 1		2/2/2007 6:06:34 AM	3.4175E-01	3.712E-01 4	.271E-01	1.983E+00	PCI/SA	0.924	1.0E+0	2.48E-1
33444	9JMLV920		J7A1001185	P-0582	FILTER	1/8/20	007 10:00:00	12/13/200	6 1:21:00 PM		
RA-228	BXTF 1		2/2/2007 6:06:34 AM	2.628E-01	3.301E-01 4	.423E-01	2.059E+00	PCI/\$A	0.962	1.0E+0	2.448E-
33443	9JMLVA20		J7A1001155	000581	FILTER	1/8/20	007 10:00:00	12/11/200	6 12:20:00 PM		
RA-228	BXTF 1		2/2/2007 6:06:22 AM	7.9041E-01	4.043E-01 4	.108E-01	1.789E+00	PCI/SA	0.835	1.0E+0	2.445E
33444	9JMLVW20		J7A1001181	P-0820	FILTER	1/8/20	007 10:00:00	12/13/200	6 12:10:00 PM		
RA-228	BXTF 1		2/2/2007 6:06:22 AM	2.9198E-01	2.929E-01 3	3.325E-01	1.594E+00	PCI/SA	0.882	1.0E+0	2.487E
33442	JMN9F2AB		J7A110000229	INTRA-LAB BLA	ANK FILTER	1/8/20	007 10:00:00	12/5/2006	12:25:00 PM		
RA-228	BXTF 1	В	2/2/2007 6:06:34 AM	1.0189E-01	9.189E-02 1	.08E-01	4.912E-01	PCI/\$A	0.99	1.0E+0	1.0E+0
33442	JMN9F2CS	-	J7A110000229	INTRA-LAB CH	ECK FILTER	1/8/2	007 10:00:00	12/5/2006	12:25:00 PM		
RA-228	BXTF 1	s	2/2/2007 6:06:34 AM		2.684E-01 4				1483E+00 0.862	1.0E+0	1.0E+0

<sup>7029198, \*\*</sup>Samples Inserted | Updated | NotUpdated => 0 | 17 | 0,

\*\*Results Inserted | ReTestInserted | Updated | NotInserted => 0 | 0 | 17 | 0.

\*\*Diff RptDb | Qtims => .

2/5/2007 5:53:12 AM

### ICOC Fraction Transfer/Status Report ByDate: 2/5/2006, 2/10/2007, Batch: '7029198', User: \*ALL Order By DateTimeAccepting

Q Batch Wo	rk Ord CurStatu	is ,	Accepting		Comments	
7029198	· · · · · · · · · · · · · · · · · · ·			<del>, , , , , , , , , , , , , , , , , , , </del>	· · · · · · · · · · · · · · · · · · ·	
AC	CalcC	WoodT	1/29/2007 10:4	3:25	•	
SC		longa	IsBatched	1/29/2007 10:30:11 AM	ICOC_RADCALC v4.8.26	
SC		WoodT	InPrep	1/29/2007 10:43:25 AM	RICH-RC-5016 Revision 5	
SC		WoodT	Prep1C	1/29/2007 11:21:47 AM	RICH-RC-5016 REVISION 5	
SC		HarrisonJ	InPrep	1/29/2007 12:36:07 PM	RICH-RC-5005 Revision 5	
SC		LongA	Sep1C	1/30/2007 8:52:09 AM	RICH-RC-5005 REVISION 5	
SC		BlackCL	InCnt1	1/30/2007 9:18:18 AM	RICH-RD-0007 REVISION 5	
SC		BlackCL	Cnt1C	1/30/2007 11:11:59 AM	RICH-RD-0007 REVISION 5	
SC		HarrisonJ	Sep2C	2/1/2007 9:18:48 AM	RICH-RC-5005 REVISION 4	
SC	-	BlackCL	InCnt2	2/1/2007 12:19:48 PM	RICH-RD-0003 REVISION 4	
SC		BlackCL	CalcC	2/2/2007 6:37:32 AM	RICH-RD-0003 REVISION 4	
AC	•	WoodT	1/29/2007 11:2	1:47		
AC		HarrisonJ	1/29/2007 12:3	6:07	:	
AC		LongA	1/30/2007 8:52	:09		
AC		BlackCL	1/30/2007 9:18	:18		
AC		BlackCL	1/30/2007 11:1	1:59	3*	
AC		HarrisonJ	2/1/2007 9:18:4	48 AM		
AC		BlackCL	2/1/2007 12:19	:48 PM		
AC		BlackCL	2/2/2007 6:37:3	32 AM		

AC: Accepting Entry; SC: Status Change

STL Richland

Richland Wa.

Batch Nbr: 7029198

## Alpha Beta, Ra-228 by GPC , Results Summary Report

2/2/2007 7:27:31 AM

Status	Meth	Matrix	Wrk Ord	Paramete	er Sa Act	Uncert	Q	Units	A	/ ILcC	IDC	QC	Yield	RYId
Ra-228	B by G	PC	Ra	-226/Ra-22	28 Deem Wit	th Out Blk S	ubt.			4.,	CRDL			
Calc 7	TF	FILTER	JMK812AD	RA-228	1.02E+00	(9.19E-01)	U4	PCI/SA	R	1.84E+00	4.03E+00	ř.	86%	
Calc -	TF	FILTER	JMK812AD	RA-228	7.02E-01	(9.85E-01)	U4	PCI/SA	R	2.04E+00	4.47E+00		86%	ż
Calc	TF.	FILTER	JMK812AD	RA-228	1.74E+00	(1.17E+00)	U4	PCI/SA	R	2.26E+00	4.96E+00	. ,	86%	:
Calc 7	TF	FILTER	JMK812AD	RA-228	1.15E+00 ∨	(5.95E-01)		PCI/SA	Α	1.18E+00	2.59E+00	/	86%	
Calc 7	TF	FILTER,	JMK812AD	RA-228	-2.50E+00	(5.55E+00)	U4	PCI/SA	R	1.26E+01	2.75E+01		86%	
Calç 7	TF	FILTER	JMLA12AD	RA-228	1.58E+00	(8.38E-01)		PCI/SA	R	1.55E+00	3.41E+00	,	93%	
Calc 7	TF	FILTER	JMLA12AD	RA-228	1.00E+00	(8.67E-01)	U4	PCI/SA	R	1.72E+00	3.78E+00	)	93%	
Calc 7	TF	FILTER	JMLA12AD	RA-228	-1.25E+00	(7.75E-01)	U4	PCI/SA	R	1.91E+00	4.19E+00	_	93%	, ;
Caic 7	TF	FILTER	JMLA12AD	RA-228	4.43E-01	(4.78E-01)	U4	PCI/SA	Α	9.97E-01	2.19E+00	1	93%	1
Calc 7	TF	FILTER	JMLA12AD	RA-228	3.11E+00	(4.91E+00)	U4	PCI/SA	R	1.02E+01	2.25E+01		93%	
Calc 7	TF	FILTER	JMLA42AD	RA-228	-2.57E-01	(8.19E-01)	U4	PCI/SA	R	1.84E+00	4.03E+00	)	88%	:
Caic 7	TF	FILTER	JMLA42AD	RA-228	1.27E+00	(1.02E+00)	U4	PCI/SA	R	2.02E+00	4.43E+00		88%	
Calc 7	TF	FILTER	JMLA42AD	RA-228	1.57E+00	(1.15E+00)	U4	PCI/SA	R	2.24E+00	4.91E+00		88%	
Calc 7	TF	FILTER	JMLA42AD	RA-228	8.59E-01 ✓	(5.81E-01)	U4	PCI/SA	Α	1.18E+00	2.57E+00	-	88%	
Calc 7	TF	FILTER	JMLA42AD	RA-228	7.56E+00	(6.35E+00)	U4	PCI/SA	R	1.26E+01	2.76E+01		88%	
Calc 7	TF	FILTER	JMLA72AD	RA-228	1.53E+00	(9.56E-01)	U4	PCI/SA	R	1.80E+00	3.98E+00	)	82%	
Calc 7	TF	FILTER	JMLA72AD	RA-228	-1.94E-02	(9.00E-01)			R	1.98E+00	4.37E+00	)	82%	
Calc 7	TF	FILTER	JMLA72AD	RA-228	-5.37E-01	(9.55E-01)	U4	PCI/SA		2.19E+00			82%	
Calc 7	TF	FILTER	JMLA72AD	RA-228	3.25E-01	(5.41E-01)	U4	PCI/SA	Α	1.15E+00	2.54E+00		82%	
Calc 7	TF	FILTER	JMLA72AD	RA-228	3.45E+00	(5.92E+00)	U4	PCI/SA	R	1.24E+01	2.72E+01		82%	
Calc 7	TF	FILTER	JMLA82AD	RA-228	1.63E+00	(8.87E-01)		PCI/SA	R	1.64E+00	3.61E+00	)	88%	
Calc 7	TF	FILTER	JMLA82AD	RA-228	2.91E-01	(8.44E-01)	U4	PCI/SA	R	1.80E+00	3.97E+00	)	88%	
Calc 7	TF	FILTER	JMLA82AD	RA-228	7.79E-01	(9.76E-01)				2.00E+00			88%	
Calc 7	TF	FILTER	JMLA82AD	RA-228	9.02E-01 V	(5.22E-01)		PCI/SA		1.05E+00			88%	
Calc 7	TF	FILTER	JMLA82AD	RA-228	-5.95 <b>E</b> +00	(4.71E+00)	U4	PCI/SA	R	1.14E+01	2.50E+01		88%	
Calc 7	TF	FILTER	JMLT22AD	RA-228	1.06E+00	(7.31E-01)	U4	PCI/SA	R	1.29E+00	3.01E+00	)	81%	
	TF	FILTER	JMLT22AD	RA-228	1.53E+00	(8.58E-01)		PCI/SA		1.43E+00			81%	
Calc 7		FILTER	JMLT22AD	RA-228	-8.41E-01	(6.13E-01)	U4	PCI/SA		1.59E+00			_ 81%	
Calc 7		FILTER	JMLT22AD	RA-228	5.82E-01	(4.28E-01)				8.31E-01			81%	
Calc 7	TF .	FILTER	JMLT22AD	RA-228	1.89E+01	(7.20E+00)		PCI/SA		1.21E+01			81%	
Calc 7	TF	FILTER	JMLT62AD	RA-228	5.85E-01	(6.10E-01)	U4	PCI/SA	R	1.17E+00	2.71E+00	,	90%	
	ŤF	FILTER	JMLT62AD	RA-228	4.94E-01	(6.56E-01)				1.29E+00			90%	
	TF	FILTER	JMLT62AD	RA-228	-1.00E+00	(5.27E-01)				1.43E+00			90%	
	TF	FILTER	JMLT62AD	RA-228	2.57E-02	(3.46E-01)				7.49E-01			90%	
	TF	FILTER	JMLT62AD	RA-228	5.73E+00	(4.28E+00)				7.64E+00			90%	
	TF	FILTER	JMLT72AD	RA-228	2.38E+00	(9.32E-01)		PCI/SA		1.34E+00			79%	
						•								
						•								
Calc T	TF TF	FILTER	JMLT72AD JMLT72AD	RA-228 RA-228	1.55E+00 1.32E+00	(8.87E-01) (9.30E-01)		PCI/SA PCI/SA		1.49E+00 1.65E+00			79% 79%	

Page 1

Q - Qualifier, U is Less Than Lc = 1.645 TPU All Results Displayed to Three Digits Reguardless of Significants Date/Time - mm/dd/yy hh mm, 24hr Time

RecCnt:39

STL Richland

RADCALC v4.8.26

() - (1s Uncertainities)
IDC - Instrument Detection Level in Conc Units

MDC - Minimum Detectable Concentration
\*Std - Lc, MDC using StdDev for Set of Blanks

MLcC- Method Decision Level in Conc Units

Alpha Beta, Ra-228 by GPC , Results 2/2/2007 7:27:32 AM Batch Nbr: 7029198 Summary Report Status Meth Matrix Wrk Ord Parameter Sa Act Uncert Units IDC Av ILcC QC Yield RYId A 8.62E-01 2.01E+00 1 Calc TF FILTER JMLT72AD **RA-228** 1.75E+00V (5.29E-01) PCI/SA 79% TF (4.11E+00) U4 PCI/SA Calc FILTER JMLT72AD **RA-228** -8.89E-01 R 9.24E+00 2.14E+01 79% Calc TF **FILTER** JMLT82AD **RA-228** PCI/SA R 1.07E+00 2.51E+00 87% 1.30E+00 (6.69E-01) TF **FILTER** (4.91E-01) U4 PCI/SA R 1.19E+00 2.79E+00 Calc JMLT82AD **RA-228** -3.66E-01 87% Calc TF **FILTER** JMLT82AD **RA-228** -7.07E-02 (5.92E-01) U4 PCI/SA R 1.32E+00 3.09E+00 87% Calc TF FILTER JMLT82AD **RA-228** 2.89E-01 (3.40E-01) U4 PCI/SA 6.89E-01 1.61E+00 L 87% TF R 8.16E+00 1.89E+01 Calc **FILTER** JMLT82AD **RA-228** 4.87E + 00(4.35E+00) U4 PCI/SA 87% Calc TF **FILTER** (6.55E-01) U4 PCI/SA R 1.20E+00 2.78E+00 83% JMLVA2AD **RA-228** 8.57E-01 Calc TF **FILTER** JMLVA2AD **RA-228** 6.34E-01 (6.88E-01) U4 PCI/SA R 1.33E+00 3.09E+00 83% Calc TF **FILTER** JMLVA2AD **RA-228** 8.80E-01 (7.85E-01) U4 PCI/SA R 1,48E+00 3,43E+00 83% TF 7.71E-01 1.79E+00レ Calc FILTER JMLVA2AD **RA-228** 7.90E-01 (4.11E-01) PCI/SA 83% TF Calc **FILTER** JMLVA2AD **RA-228** -4.83E-01 (4.23E+00) U4 PCI/SA R 9.39E+00 2.14E+01 83% Calc TF **FILTER** JMLVW2AD **RA-228** 6.63E-01 (5.71E-01) U4 PCI/SA R 1.06E+00 2.48E+00 88% Calc TF **FILTER** JMLVW2AD **RA-228** (6.34E-01) U4 PCI/SA R 1.17E+00 2.75E+00 88% 7.36E-01 Calc TF FILTER JMLVW2AD **RA-228** -5.24E-01 **(5.16E-01) U4** PCI/SA 1.30E+00 3.05E+00 88% Calc TF **FILTER** JMLVW2AD **RA-228** 2.92E-01 \ (3.33E-01) U4 PCI/SA A 6.79E-01 1.59E+00 88% Calc TF FILTER JMLVW2AD **RA-228** 1.29E+01 (5.27E+00)PCI/SA R 8.28E+00 1.91E+01 88% TF (6.77E-01) U4 PCI/SA Calc FILTER JMLV32AD **RA-228** 1.07E+00 R 1.20E+00 2.77E+00 85% TF FILTER (6.37E-01) U4 PCI/SA 1.33E+00 3.07E+00 Calc JMLV32AD **RA-228** 2.53E-01 85% Calc TF FILTER **RA-228** (8.34E-01) U4 PCI/SA 1.47E+00 3.41E+00 JMLV32AD 1.32E+00 85% TF 8.81E-01L PCI/SA 7.69E-01 1.78E+00 \ Calc **FILTER** JMLV32AD **RA-228** (4.16E-01) 85% Calc TF PCI/SA FILTER JMLV32AD **RA-228** 9.97E+00 8.41E+00 1.94E+01 85% (5.01E+00) (5.98E-01) U4 PCI/SA Calc TF FILTER JMLV52AD **RA-228** 5.87E-01 R 1.15E+00 2.67E+00 93% Calc TF FILTER JMLV52AD **RA-228** 2.05E-01 (6.09E-01) U4 PCI/SA 1,28E+00 2,96E+00 93% TF Calc **FILTER** JMLV52AD **RA-228** (7.17E-01) U4 PCI/SA 1.42E+00 3.28E+00 93% 5.57E-01 A 7.40E-01 1.71E+00 L Calc TF FILTER JMLV52AD **RA-228** 4.50E-01レ (3.72E-01) U4 PCI/SA 93% Calc (4.48E+00) U4 PCI/SA 7.99E+00 1.84E+01 93% TF FILTER JMLV52AD **RA-228** 6.91E+00 TF Calc FILTER JMLV82AD **RA-228** 1.17E+00 (7.37E-01) U4 PCI/SA R 1.40E+00 3.08E+00 92% Calc TF **FILTER** JMLV82AD **RA-228** 1.18E-01 (7.18E-01) U4 PCI/SA R 1.55E+00 3.42E+00 92% Calc TF **FILTER** JMLV82AD **RA-228** -2.62E-01 (7.64E-01) U4 PCI/SA 1.72E+00 3.80E+00 92% TF **FILTER** 8.99E-01 1.98E+00 Calc JMLV82AD **RA-228** 3.42E-01° (4.27E-01) U4 PCI/SA 92% Calc TF **RA-228** (4.91E+00) U4 PCI/SA R 9.73E+00 2.14E+01 FILTER JMLV82AD 5.28E+00 92% Calc TF **FILTER** JMLV92AD **RA-228** (7.98E-01) PCI/SA R 1.46E+00 3.20E+00 96% 1.62E+00 Calc TF **FILTER** JMLV92AD **RA-228** 8.57E-02 (7.47E-01) U4 PCI/SA R 1.62E+00 3.55E+00 96% Calc TF FILTER JMLV92AD **RA-228** (7.52E-01) U4 PCI/SA R 1.80E+00 3.94E+00 96% -9.20E-01 2.63E-01 ' (4.42E-01) U4 PCI/SA 9.40E-01 2.06E+00 Calc TF **FILTER** JMLV92AD **RA-228** 96% Calc TF FILTER JMLV92AD **RA-228** (4.53E+00) U4 PCI/SA R 1.02E+01 2.22E+01 96% -2.25E+00

TF

Calc

Calc TF

FILTER

FILTER

JMN9F2AA

JMN9F2AA

**RA-228** 

RA-228

Page 2

(2.00E-01)

(1.59E-01) U4 PCI/SA

4.98E-01

-2.34E-01

PCI/SA

RecCnt:78
RADCALC v4.8.26
STL Richland

99%

99%

3.49E-01 7.64E-01

R 3.87E-01 8.48E-01

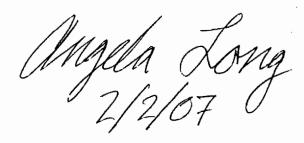
<sup>() - (1</sup>s Uncertainities)

IDC - Instrument Detection Level in Conc Units

MLcC- Method Decision Level in Conc Units MDC - Minimum Detectable Concentration \*Std - Lc. MDC using StdDev for Set of Blanks

Q - Qualifier, U is Less Than Lc = 1.645\*TPU
All Results Displayed to Three Digits Reguardless of Significants
Date/Time - mrn/dd/yy hh:mm, 24hr Time

Batch	Nbr: 7	029198		Alpha B	eta, Ra-2	228 by G	iPC , F	Results	2	2/2/20	07 7:27	:32 AM
					Sumn	nary Re <sub>l</sub>	oort			· .		
Status	Meth	Matrix	Wrk Ord	Paramete	r Sa Act	Uncert	Q Units	Av ILcC	IDC	QC	Yield	RYId
Calc	TF.	FILTER	JMN9F2AA	RA-228	4.14E-02	(1.99E-01)	U4 PCI/SA	R 4.30E-01	9.41E-01	В	99%	,
Calc	TF	FILTER	JMN9F2AA	RA-228	1.02E-01 🗸	(1.08E-01)	U4 PCI/SA	A 2.24E-01	4.91E-01	в∨	99%	
Calc	TF	FILTER	JMN9F2AA	RA-228	1.84E+00	(1.15E+00)	U4 PCI/SA	R 2.15E+00	4.73E+00	В	99%	
Calc	TF	FILTER	JMN9F2AC	RA-228	5.31E+00	(6.78E-01)	PCI/SA	R 3.82E-01	8.43E-01	s	86%	103%
Calc	TF	FILTER	JMN9F2AC	RA-228	5.79E+00	(7.43E-01)	PCI/SA	R 4.24E-01	9.36E-01	S	86%	112%
Calc	TF	FILTER	JMN9F2AC	RA-228	5.37E+00	(7.22E-01)	PCI/SA	R 4.70E-01	1.04E+00	S	86%	104%
Calc	TF	FILTER	JMN9F2AC	RA-228	5.49E+00	(4.13E-01)	PCI/SA	A 2.46E-01	5.42E-01	s 🗸	86%	107%
Calc	TF	FILTER	JMN9F2AC	.RA-228	8.82E+00	(1.94E+00)	PCI/SA	R 2.44E+00	5.41E+00	S	86%	171%



<sup>() - (1</sup>s Uncertainities)
IDC - Instrument Detection Level in Conc Units
MLcC- Method Decision Level in Conc Units
MDC - Minimum Detectable Concentration
"Std - Lc, MDC using StdDev for Set of Blanks

Batch N	Batch Nbr: 7029198	8			Alpha Beta	Beta,	Ra-2	1, Ra-228 by GPC		, Calculated Results	Resul	ts	enderstehenden zum eine sin in ten, ist ist in ten eine sin eine sin e	2/2	2/2/2007 7:27:32 AM	AM
		Shop		onatusis	1	CS	, 710	Detailed	Detailed Report							
Sq Status Me	Status Method Matrix			t	Pic	Units/Matrix	1	QC/BB Sa/On Date	AnalysisDate/PptWt	1	Sep1/Sep2 Date	QC/Tracer	QC/Tracer Vial Mult/EntYld	id Total/Analy Vol	y Vol Final/Count Vol	Vol
1 Calc TF 500403,P-0812	FILTER		*STLE Ra228WoBS		JMK812AD -1 v4.8.26	PCI/SA FILTER		12/05/06 12:25	02/02/07 06:05 29.4		01/30/07 08:41	RATA25421R	121R 1	1.00 SA 0.235793 SA	SA SA	
Sq Cnt Date		Parameter	Sample Cnt Bkgrnd Cnt	gmd Cnt	Instr	Geom	Trc/Av El	Ent Efficiency1	Efficiency 2 Ent	t Yid Fct	Ent	Bik Value	Ingr Fct (	Conv Fct/VolAdj Decay		Abn
0 02/01/07 13:17	13:17 RA-228		45 2	297 ,	GPC7A /	\	z z >	5.4150E-01 (1.622E-02)	1.0000E+00 N (0.000E+00)	%2 %2	z	The state of the s	1.5544E+00 (0.000E+00)	4.5045E-01 4.241005	1.0186E+00	
1 02/01/07 14:12	14:12 RA-228		42 . 2	297	GPC7A	-	z z >	5.4150E-01	1.0000E+00 N	%2 %2	z		1.7250E+00	4.5045E-01 4.241005	1.0186E+00	
2 02/01/07	02/01/07 15:07 RA-228			297	GPC7A	-	z		1.0000E+00 N	% <b>9</b> 8	z			4.5045E-01	1.0186E+00	
	`			400			>	(1.622E-02)		%/			(0.000E+00)	4.241005		
3 02/02/67	02/02/67 06:05 RA-228		36 3	311 / 400 /	GPC7A	-	z z z	5.4150E-01 (1.622E-02)	1.0000E+00 N (0.000E+00)	%2 %2	z		1.0406E+01 (0.000E+00)	4.5045E-01 4.241005	1.0186 <b>E</b> +00	
Sq Calc Date		Parameter	Avg Sa Act	σ	Net	Net Cnt Rt	Dpm Wo Bik	Bik Dpm-Bik	BIK Vol Used	_	Yield,EnFct		Chem Yid, EFctU IDCALcC	BIKL <sub>c</sub> C/MDC	MDC StdDvMdC/LcC	ပ္ပ
02/02/07	7 RA-228		A 1.021122 (0.919265)	£ 04	1.57500E-01 (1.4091E-01)		0.524756 (0.471625)	) 0.524756 5) (0.471625)	5) (0.014	1.00 SA 142)	%98		4.025176			
02/02/07	)7 RA-228	28	R 0.701512 (0.985249)	<b>4</b>	9.75000E-02 (1.3659E-01)		0.360508 (0.505975)	0.360508 5) (0.505975)	(0.014	1.00 SA 142)	%98		4.467026			
02/02/07	)7 RA-228		R 1.736695 (1.171596)	, (c	2.17500E-01 (1.4511E-01)	_	0.892491	0.892491	(0.014	1.00 SA 142)	%98		4.957379			
02/02/07	)7 RA-228	28	A 1.15311 (0.595203)		1.57500E-01 (8.1356E-02)		0.592585 (0.305286)	0.592585 6) (0.305286)	900:0) (9	1.00 <b>S</b> A 165)	<b>86%</b>		2.588373 1.181906			
02/02/07	)7 RA-228	28	R -2.495568 (5.55413)	2	-5.75000E-02 (1.2784E-01)		-1.282477 (2.8535)	7 -1.282477 (2.8535)	(0.014	1.00 SA 142)	% <del>9</del> 8		27.518659 12.590634	C) 4		ange i destantanta di la se
Sq Status Method	thod Matrix		Protocol Equation Set		Wrk Ord	Units/Ma	atrix QC/I	QC/BB Sa/On Date	AnalysisDate/PptWt	1	Sep1/Sep2 Date	QC/Tracer Vial	Vial Mult/EntYld	ld Total/Analy Vol	y Vol Final/Count Vol	Vol
2 Calc TF 536403,P-0813	FILTER		STLE Ra228WoBS ,J7A090287		JMLA12AD -2 v4 8.26	PCI/SA FILTER		12/05/06 12:10	02/02/07 06:05 28.9		01/30/07 08:41	RATA25422 RATA25422 Alq	122 1 122 Alq 111%	1.00 SA 0.249299 SA	AS AS	
Sq Cnt Date		Parameter (	Sample Cnt Bi	Bkgrnd Cnt	Instr	Geom	Trc/Av Er	Ent Efficiency1	Efficiency 2 Ent	Yld Fct	Ent	Blk Value	ingr Fct (	Conv Fct/VolAdj	Decay	Abn
0 02/01/07 13:17	13:17 RA-228		49 650 64	280 1	GPC7B	-	z z >	5.4307E-01 (1.561E-02)	1.0000E+00 N (0.000E+00)	93%	z	To the same of the	1.5544E+00 (0.000E+00)	4,5045E-01 4,011256	1.0186E+00	
1 02/01/07 14:12	14:12 RA-228		43 <b>6</b> 23 50 46	280	GPC7B	-	z z >	5.4307E-01 (1.561E-02)	1.0000E+00 N (0.000E+00)	93%	z		1.7250E+00 (0.000E+00)	4.5045E-01 4.011256	1.0186E+00	
2 02/01/07 15:07	15:07 RA-228		26 / 28	280	GPC7B	-	z z >	5.4307E-01 (1.561E-02)	1.0000E+00 N (0.000E+00)	93%	z		1.9144E+00 (0.000E+00)	4.5045E-01 4.011256	1.0186E+00	yr
() - (1s Unce IDC - Instrumer Sr-89 Counts a	tainities), Q - nt Detection Le re Derived fron	Qualifier, L	J Result is Less 7 : Units, MLcC - N vination of Each	han Lc = 1.1 Aethod Decii 3r-89/90 and	345 • TPU sion Level i Y-90 Cour	n Conc Uni rt, All Resu	Is, MDC-	Page 1 Minimum Detectable ay Not be Significant	(1s Uncertainities), Q · Qualifier, U Result is Less Than Lc = 1.645 • TPU IDC • Instrument Detection Level in Conc Units, MLcC • Method Decision Level in Conc Units, MDC· Minimum Detectable Concentration Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time • mn/dd/yy hh.mm, 24hr Time	Vdd/yy hh:mm	n, 24hr Time	C V SAN LY CONTROL OF THE CONTROL OF	RecCnt:2	estate en entre en estate en estate en estate en estate en estate en estate en estate en estate en estate en e	RADCALC v4.8.26 STL Richland	9
										**					A STATE OF THE PERSON NAMED IN THE PERSON NAME	A MARKET SHARE

RA-228 38		_			_	)	2	
	8 , 271 ,		N N 5.	N 5.4307E-01 1.0	)00E+	N %86	1.0406E+01 4.5045E-01	:01 1 0186E+00
20	400	,						;
•	Avg Sa Act	Q Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Yield,EnFct Chem Yid,EFctU IDCALcC Bile	BIKLcC/MDC StdDvMdC/LcC
_	R 1.577788 (0.838231)	2.80000E-01 (1.4612E-01)	0.857267 (0.453256)	0.857267 (0.453256)	1.00 SA (0.014142)	%86	3.405743	
_	H 1.000563 (0.866605)	U4 1.60000E-01 (1.3766E-01)	0.54364 (0.470008)	0.54364 (0.470008)	1.00 SA (0.014142)	%86	3.779597 1.72135	
_	R -1.249196 (0.775031)	U4 -1.80000E-01 (1.1023E-01)	-0.678731 (0.419621)	-0.678731 (0.419621)	1.00 SA (0.014142)	%86	4.19449 1.910306	
	A 0.443052 (0.477762)	U4 8.66667E-02 (7.6340E-02)	0.240725 (0.258721)	0.240725 (0.258721)	1.00 SA (0.008165)	%86	2.190049 0.997419	
_	R 3.112069 (4.912753)	U4 8.25000E-02 (1.2998E-01)	1.690894 (2.667821)	1.690894 (2.667821)	1.00 SA (0.014142)	%86	22.462752 10.215174	
Prot	Protocol Equation Set	Wrk Ord Units/	Units/Matrix QC/BB S	QC/BB Sa/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial Mult/EntYid Total	Total/Analy Vol Final/Count Vol
·ST	STLE Ra228WoBS JMLA42 J7A090287-3 v4.8.26	JMLA42AD PCI/SA	_	12/05/06 12:45	02/02/07 06:05 0 30.3 0	01/30/07 08:41 02/01/07 09:00	RATA25423 1 RATA25423 Alq 100% 0.241	1.00 SA 0.241963 SA
Parameter S	Sample Cnt Bkgrnd Cnt	Cnt Instr Geom	Trc/Av	Ent Efficiency1 E	Efficiency 2 Ent Yld	Yld Fet Ent I	Bik Value Ingr Fct Conv Fct/	Conv Fct/VolAdj Decay Abn
RA-228 36 50	6 304 0 400	GPC1B A	Z >	5.2336E-01 1.0 (1.538E-02) (0.	1.0000E+00 N 88 (0.000E+00) 7	88% N 7%	1.5550E+00 4.5045E-01 (0.000E+00) 4.132871	-01 1.0186E+00
RA-228 47 50	304	GPC1B 1	Z >	5.2336E-01 1.0 (1.538E-02) (0.	1.0000E+00 N 8E (0.000E+00) 7	88% N 7%	1.7094E+00 4.5045E-01 (0.000E+00) 4.132871	-01 1.0186E+00 1
RA-228 48 50	8 304	GPC1B 1	N >	5.2336E-01 1.0 (1.538E-02) (0.	1.0000E+00 N 88 (0.000E+00) 7	88% N 7%	1.8970E+00 4.5045E-01 (0.000E+00) 4.132871	-01 1.0186E+00
RA-228 47 50	307	, GPC7C /	NN	5.1299E-01 1.0 (1.642E-02) (0.0	1.0000E+00 N 8E (0.000E+00) 7:	88% N 7%	1.0406E+01 4.5045E-01 (0.000E+00) 4.132871	-01 1.0186 <b>E</b> +00
Parameter A	Avg Sa Act	O Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,EnFct	Chem Yid, EFctU IDC/ILcC	BIKLCC/MDC StdDvMdC/LcC
	R -0.256623 (0.819486)	U4 -4.00000E-02 (1.2767E-01)	-0.13533 (0.432099)	-0.13533 (0.432099)	1.00 SA (0.014142)	88%	4.025709	
RA-228 F	R 1.269508 (1.022606)	<b>U4</b> 1.80000E-01 (1.4387E-01)	0.669475 (0.538148)	0.669475 (0.538148)	1.00 SA (0.014142)	88%	4.425579 2.022859	
_	R 1.565355 (1.147591)	U4 2.00000E-01 (1.4526E-01)	0.82549 (0.60366)	0.82549 (0.60366)	1.00 SA (0.014142)	%88	4.911227 2.244841	
	A 0.859413 (0.580636)	U4 1.13333E-01 (8.0346E-02)	0.453212 (0.305636)	0.453212 (0.305636)	1.00 SA (0.008165)	%88	2.571617	
_	R 7.555641 (6.350366)	U4 1.72500E-01 (1.4394E-01)	3.984468 (3.34246)	3.984468 (3.34246)	1.00 SA (0.014142)	%88	27.608194 12.624591	
ifier, U	() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU IDC - Instrument Defection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration	c = 1.645 * TPU	pite MDC Mini	Page 2	opposite		RecCnt:4	RADCALC v4.8.26

FILTER 'S FILTER 'S FILTER 'S S:17 RA-228 E:02 RA-228 E:06 RA-228 E:06 RA-228 E:06 RA-228 E:06 RA-228 E:06 RA-228 E:06 RA-228 E:06 RA-228 E:06 RA-228 E:06 RA-228 E:06 RA-228 E:06 RA-228 E:06 RA-228 E:06 RA-228 E:06 RA-228	STLE Razzswobs JMLA72  -STLE Razzswobs JMLA72  J7A0902874 v4.8.26  Sample Cnt Bkgrnd Cnt Int 41 241 GP 50 400  27 241 GP 50 400  27 241 GP 50 400  37 266 GP 50 400  Avg Sa Act Q  R 1.532286 U4 2  (0.95586) (	APPL OF THE CONTROL O	Unite/Matrix QC/BB 3 PCI/SA 12/0 Geom Tre/Av Ent 7 T N N 5. 7 T Y (1) Y	38 Sa/On Date 2/05/06 12:30 2/05/06 12:30 11 Efficiency1 5.1164E-01 (1.846E-02) 5.1164E-01 (1.846E-02) 5.2380E-01 (1.539E-02) 5.2380E-01 (1.539E-02) 5.2380E-01 (1.539E-02) 5.2380E-01 (1.539E-02) 5.2380E-01 (1.539E-02) 5.2380E-01 (1.539E-02) 5.2380E-01 (1.539E-02) 5.2380E-01 (1.539E-02) 5.2380E-01	AnalysisDate/PptWt  02/02/07 06:06 29.2 Efficiency 2 Ent .0000E+00 N 0.000E+00	Sep1/Sep2 Date 01/30/07 08:41 02/01/07 09:00 Yid Fct Ent E 82% N 7% N 7% N 7% N 7% N 7% N 7% N 7% N 7	GCTracer Vial MutrEntYld  RATA25433 1  RATA25433 1  BIK Value ingr Fct Con 1.5550E+00 4.5 (0.000E+00) 4.11 1.8970E+00 4.5 (0.000E+00) 4.11 1.8970E+00 4.5 (0.000E+00) 4.11 1.0409E+01 4.5 (0.000E+00) 4.11 1.0409E+01 4.5 (0.000E+00) 4.11 1.799099 1.799099	10186E+00
23,P-0815, 4 Cnt Date Parameter 02/01/07 13:17 RA-228 02/01/07 14:07 RA-228 02/01/07 15:02 RA-228 02/02/07 06:06 RA-228 1 Catc Date Peremeter 02/02/07 RA-228	A00 - Sa Act - Cont 985 98 - Cont 98	B 26 Instr   Capcic	A H E	2/05/06 12:30  11 Efficiency1 5.1164E-01 (1.846E-02) 5.1164E-01 (1.846E-02) 5.1164E-01 (1.846E-02) 5.2380E-01 (1.539E-02) BIR Dpm-B 0.803723 (0.499486	02/02/07 06:06 29.2 Efficiency 2 Ent .0000E+00 N .0000	01/30) 02/01/1 82% 7% 7% 7% 7% 7% 82% 7% 7% SA	Bik Value ingr Fct  Bik Value ingr Fct  1.5550E+00  (0.000E+00)  1.7094E+00  (0.000E+00)  1.8970E+00  (0.000E+00)  1.0409E+01  (0.000E+00)  ct Chem Yid, EFctU IDCAILCC  3.9779  1.799099	28A 28A 1.01 1.01
Cnt Date Parameter 02/01/07 13:17 RA-228 02/01/07 14:07 RA-228 02/02/07 15:02 RA-228 1 Calc Date Parameter 02/02/07 RA-228	241 400 - 241 400 - 241 400 - 241 400 - 266 - 400 5a Act 532286 .955586)	GPC1C GPC1C GPC1C GPC1C GPC1B A Net G (1.3381f (1.3381f (1.16226 (1.16226 (1.16226 (1.16226)	E	5.1164E-01 (1.846E-02) 5.1164E-01 (1.846E-02) 5.1164E-01 (1.846E-02) 5.2380E-01 (1.539E-02) 81k Dpm-B 0.803723 (0.499486) (0.47211)	Efficiency 2 Ent .0000E+00 N .0000E+00 N .0000E+00 N .0000E+00 N .0000E+00 N .0000E+00 N .0000E+00 N .0000E+00 N .0000E+00 N .00014142) 1.00 (0.014142)	82% 7% 82% 7% 7% 7% 7% 7% 7% SA	31k Value 'ngr. Fct 1.5550E+00 (0.000E+00) 1.7094E+00 (0.000E+00) 1.8970E+00 (0.000E+01) 1.0409E+01 (0.000E+01) 3.9779 1.799099	1.0186E+00 1.0186E+00 1.0186E+00 1.0186E+00
2/01/07 13:17 RA-228 41 50 2/01/07 14:07 RA-228 30 50 2/01/07 15:02 RA-228 27 50 2/02/07 06:06 RA-228 37 50 Caic Date Perameter Avg 02/02/07 RA-228 R	, , , , , , , , , , , , , , , , , , , ,	5 5 5 5		5.1164E-01 (1.846E-02) 5.1164E-01 (1.846E-02) 5.1164E-01 (1.846E-02) 5.2380E-01 (1.539E-02) BIK Dpm-B (0.803723 (0.499486 (0.47211)	.0000E+00 N .0000E+00) .0000E+00) .0000E+00 N .0000E+00) .0000E+00) .0000E+00) .0000E+00) .0000E+00)	82% 7% 7% 7% 7% 82% 7% SA	1.5550E+00 4.504 (0.000E+00) 4.155 1.7094E+00 4.504 (0.000E+00) 4.155 1.8970E+00 4.504 (0.000E+00) 4.155 1.0409E+01 4.504 (0.000E+00) 4.155 3.9779 1.799099 4.37302	1.01
2/01/07 14:07		5 5 5		5.1164E-01 (1.846E-02) 5.1164E-01 (1.846E-02) 5.2380E-01 (1.539E-02) Blk Dpm-B 0.803723 3) (0.499488 (0.47211)	0.0000E+00 N 0.0000E+00 N 0.000E+00 N 0.0000E+00 N 0.0000E+00 N 0.000E+00 N 0.0014	82% 82% 77% 77% 77% 5A	1:7094E+00 4:504 (0.000E+00) 4.155 1:8970E+00 4.504 (0.000E+00) 4.155 1.0409E+01 4.504 (0.000E+00) 4.155 Chem Yid, EFCIU IDCAIL.cc 3.9779 1.799099 4.37302	1.01
2/01/07 15:02 RA-228 27 50 2/02/07 06:06 RA-228 37 50 Caic Date Parameter Avg 02/02/07 RA-228 R	- 0 9 0	5 5		5.1164E-01 (1.846E-02) 5.2380E-01 (1.539E-02) BIK Dpm-B 0.803723 3) (0.499486 6 -0.010156 7 -0.281757	.0000E+00 N .0000E+00) .0000E+00) . Vol User (0.014	82% 82% 7% 5A SA	1.8970E+00 4.504 (0.000E+00) 4.155 1.0409E+01 4.504 (0.000E+00) 4.155 Chem Yid,EFciU IDC//LcC 3.9779 1.799099 4.37302	1.01
2/02/07 06:06 RA-228 37 50 Caic Date Parameter Avg 02/02/07 RA-228 R	( <b>(</b>	5		5.2380E-01 (1.539E-02) Blik Dpm-B 0.803723 5) (0.499488 6 -0.010156 (0.47211)	0.000E+00 N 0.000E+00 N 0.014	82% 7% SA SA	1.0409E+01 4.504 (0.000E+00) 4.155 Chem Yid, EFCIU IDCAILCC 3.9779 1.799099 4.37302	1.01
Caic Date Perameter Avg 02/02/07 RA-228 R				Bik 0.8 3) (0.8 (0.0 0.0	(0.014 (0.014	& &	Chem Yid, EFctU IDC/ILcC 3,9779 1.799099 4.37302	
RA-228 R			00 70 73	(C) (D)	(0.014	& &	,	BIKLCC/MDC StdDvMdC/LcC
(0.1			T & T &		(0.014	SA		
02/02/07 RA-228 R - <b>0.</b> (	(1,70005-		7 3				1.977801	
02/02/07 RA-228 R - <b>0.6</b>	-0.537166 (0.955008)	(1.1093E-01)	(21/005:0) (10	(0.500712)	(0.014	SA 82%	4.852901 2.194839	
02/02/07 RA-228 A <b>0.3</b>	0.325253	U4 5.08333E-02 (6.9697E-02)	02 0.170603 02) (0.283448)	03 0.170603 148) (0.283448)	1.00 SA (0.008165)	SA 82%	2.541077	
02/02/07 RA-228 R 3.4		U4 7.50000E-02	02 1.812166 (3.104008)	66 1.812166 108) /3 104008)		SA 82%		
(a)	(5.920469)	-1.503.1J	2			The state of the s	12.358818	
Protocol	Protocol Equation Set	Wrk Ord U	Units/Matrix Q	QC/BB Sa/On Date	Analysis Date/PptWt	Sep1/Sep2 Date	te QC/Tracer Viai Mult/EntYld Total/Analy Vol	aly Vol Final/Count Vol
Calc TF FILTER *STLE Ra 96403,000580 t	Ra228WoBS JMLA82 J7A090287-5 v4.8.26	AD	PCI/SA FILTER	12/05/06 12:50	02/02/07 06:06 28.6	01/30/07 08:41 02/01/07 09:00	RATA25424 1 RATA25424 Alq 106% 0.249	1.00 SA 794 SA
Sq Cnt Date Parameter Sample Cnt	Cnt Bkgmd Cnt	Instr	Geom Trc/Av	Ent Efficiency1	Efficiency 2 Ent	Yld Fct Ent	Blk Value Ingr Fct Conv Fct/VolAdj	Adj Decay Abn
02/01/07 13:17 RA-228 45 ~ 50	255 <b>/</b> 400 <b>/</b>	GPC1D 1	z >	N 5.2143E-01 (1.783E-02)	1.0000E+00 N (0.000E+00)	88% N 7%	1.5550E+00 4.5045E-01 (0.000E+00) 4.003306	1.0186E+00
02/01/07 14:07 RA-228 34 ~ 50	25 <b>5</b> 400	GPC1D 1	z >	N 5.2143E-01 (1.783E-02)	1.0000E+00 N (0.000E+00)	88% N 7%	1.7094E+00 4.5045E-01 (0.000E+00) 4.003306	1.0186E+00
02/01/07 15:02 RA-228 37 , 50	2 <b>55</b>	GPC1D 1	z >	N 5.2143E-01 (1.783E-02)	1.0000E+00 N (0.000E+00)	88% N 7%	1.8970E+00 4.5045E-01 (0.000E+00) 4.003306	1.0186E+00
02/02/07 06:06 RA-228 26 ~ 50 ~	264 /	GPC1C 1	z z	N 5.1132E-01 (1.845E-02)	1.0000E+00 N (0.000E+00)	88% N 7%	1.0409E+01 4.5045E-01 (0.000E+00) 4.003306	1.0186E+00
() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU	is Less Than LC =	1.645 • TPU		Page 3	3		RecCnt:5	RADCALC v4.8.26

A A A A A A A A A A A A A A A A A A A				{	0400 040		7		70401						
Batch Nbr: 7029198	29198			₹	Alpi la pela,		טשט עט סא־פּר	•	Calculated Results	nesn	<b>3</b>		2/2	2/2/2007 /:27:33 AM	 Μ
Sq Calc Date	Parameter	Avg	Sa Act	o	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	v Vol Used	_	Yield,EnFc	Chem Yld,E	Yield, EnFct Chem Yid, EFctU IDC//LcC	BIKLCC/MDC	MDC StdDvMdC/LcC	ပ္ပ
02/02/07	RA-228	Œ	1.634797 (0.88 <b>7</b> 354)	•	2.62500E-01 (1.3998E-01)	0.890013 (0.480873)	0.890013 (0.480873)	(0.014	1.00 SA 142)	% <b>8</b> 8		3.607508 1.635952			Ya Manner
02/02/07	RA-228	Œ	0.290972 (0.844422)	2	4.25000E-02 (1.2326E-01)	0.15841 (0.459645)	0.15841 (0.459645)	(0.014	1.00 SA 142)	88%		3.965838			
02/02/07	RA-228	Œ	0.778764 (0.975991)	2	1.02500E-01 (1.2804E-01)	0.423973 (0.53089)	0.423973 (0.53089)	1.00 (0.014142)	1.00 SA 142)	%88		4.401036			
02/02/07	RA-228	⋖ .	0.901511 (0.522069)		1.35833E-01 (7.5411E-02)	0.490799 (0.283697)	0.490799 (0.283697)	(0.008	1.00 SA 165)	%88		2.304471			***
02/05/07	RA-228	<b>cc</b> .	-5.951925 (4.706154)	2	-1.40000E-01 (1.0977E-01)	-3.240336 (2.556577)	-3.240336 (2.556577)	(0.014	1.00 SA 142)	%88		25.016974 11.363112	4 ()		enemants of the
Sq Status Method	Matrix P	rotoce	Protocol Equation Set	Wrk Ord	Ord Units/Matrix		QC/BB Sa/On Date	AnalysisDate/PptWt	[	Sep1/Sep2 Date	QC/Tracer \	QC/Tracer Vial Mult/EntYld	ld Total/Analy Vol	y Vol Final/Count Vol	No.
6 Calc TF F 536403,P-0816	FILTER	STLE	Ra228WoBS ,J7A100115	JML T22AD	2AD PCI/SA		12/11/06 11:40	02/02/07 06:06 30.0		01/30/07 08:41 02/01/07 09:00	RATA25425 RATA25425 Alq	25 1 25 Alq 93%	1.00 SA 0.238454 SA	SA	
Sq Cnt Date	Parameter		Sample Cnt Bkgmd Cnt		Instr Geom	Geom Trc/Av Ent I	Ent Efficiency1	Efficiency 2 Ent	Yld Fct	Ent	Bik Value	Ingr Fct	Conv Fct/VolAdj Decay		Abn
0 02/01/07 13:12	RA-228	19	97 394	ğ	GPC3A 1	Z > Z 4, 4,	4.6168E-01 1. (4.105E-02) (C	1.0000E+00 N (0.000E+00)	81%	z	and the same and t	1.5410E+00 (0.000E+00)	4.5045E-01 4.193685	1.0166E+00	
1 02/01/07 14:07	RA-228	21	97 394	Ö	GPC3A 1	Z ≻ Z 4. 4.	4.6168E-01 1. (4.105E-02) (0	1.0000E+00 N (0.000E+00)	81% 6%	z		1.7102E+00 (0.000E+00)	4.5045E-01 4.193685	1.0166E+00	
2 02/01/07 15:02	RA-228	٠ 8 ي	97	9	GPC3A 1	N >	4.6168E-01 1.	1.0000E+00 N (0.000E+00)	81% %9	z		1.8979E+00	4.5045E-01 4.193685	1.0166E+00	
3 02/02/07 06:06	RA-228	20 23	240	9	GPC1D 1	z		1.0000E+00 N	81%	z		1.0409E+01	4.5045E-01	1.0166E+00	
Sa Calc Date	Parameter	50	Sa Act	o	Net Cat Rt	N (1	.784E-02) Dom-B	(0.000E+00) Ik Vol Used	%9 •	Yield EnFet		(0.000E+00) Chem Vid EEctly IDC/II oc	4.193685.	S- I/OPMADAIS OOM	ç
١č	RA.228	ď	-		1 33807E-01	0 551704	c		100.00	81%		2.010748		- 1	}
107070	077.00	Ξ.	(0.731265)	_	(9.0691E-02)	(0.379708)	(0.379708)	(0.014	142)	<u>e</u>		1.292563	,		
02/02/07	RA-228	Œ	1.527281 (0.858209)	,	1.73807E-01 (9.4999E-02)	0.795294 (0.444976)	0.795294 (0.444976)	(0.014	1.00 SA 142)	81%		3.343462			
02/02/07	RA-228	Œ	-0.840537 (0.612984)	2	-8.61929E-02 (6.1845E-02)	-0.437689 (0.318385)	-0.437689 (0.318385)	1.00 (0.014142)	1.00 SA 142)	81%		3.71048			
02/02/07	RA-228	∢	0.582078 (0.427788)	2	7.38071E-02 (4.8390E-02)	0.303103 (0.221999)	0.303103 (0.221999)	(0.008	1.00 SA 165)	81%		1.937335 0.831177			*** * *
02/02/07	RA-228	α	18.925731 (7.19785)		4.00000E-01 (1.4663E-01)	9.855107 (3.712956)	9.855107 (3.712956)	1.00 (0.014142)	1.00 SA 142)	81%		26.665503 12.057692	<sub>2</sub> ع		
													-, ·.		
() - (1s Uncertaintities), O - Qualifier, U Result is Less Than Lc = 1.845 • TPU  IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration	s), Q - Qualifier tion Level in Co	T. U. Re	sult is Less Than Lots, MLcC - Method	) = 1.645 Decision	• TPU Level in Conc Ur	ilts, MDC-Minin	Page 4	Concentration			TO SOLVE A STATE OF THE PARTY O	RecCnt:7	The second secon	RADCALC v4.8.26	9
Sr-89 Counts are Deriv	ed from the Co	mbinat	ion of Each Sr-89/90	0 and Y-	90 Count, All Res	<b>ult Digits May N</b>	ot be Significant	s, Date/Time - mm	J/dd/yy hh:mm	. 24hr Time				, , , , ,	

Batch Nbr: 7029198	29198		Alpha	Beta,		Ra-228 by GPC		ulated	, Calculated Results	Company of the compan	2/12	2/2/2007 7:27:34 AM
Sq Status Method Matrix		Protocol Equation Set	Wrk Ord	Units/Matrlx	itrix OC/88	OC/BB Sa/On Date	AnalysisDate/PptWt	1	Sep1/Sep2 Date (	QC/Tracer Vial Mult/Ent/Yid	ntYid Total/Analy Vol	ily Vol Final/Count Vol
16 Calc TF F	FILTER	*STLE Ra228WoBS JMI	JMN9F2AA	PCI/SA FILTER	8 12/	12/05/06 12:25	02/02/07 06:06 30.8	4	01/30/07 08:41 02/01/07 09:00	RATA25436 1 RATA25436 Alq 11	1.00 SA 111% 1.00 SA	SA SA
Sq Cnt Date	Parameter	Sample Cnt Bkgrnd Cnt	Cnt Instr	Geom	Trc/Av Ent	Efficlency1	Efficiency 2 Ent	Yld Fct	Ent BIJ	Bik Value Ingr Fct	Conv Fct/VolAdj Decay	Adj Decay Abn
0 02/01/07 13:17	RA-228	58 7 301	GPC5C	/L zi	z	5.8995E-01	1.0000E+00 N	%66 %8	<b>X</b>	1.5571E+00	00 4.5045E-01	1.0186E+00
00,000	000			T.	_	00000		2 6	7	0.10001.		L
02/01/07 14:13	077-440	50 400	5	Ü	z z >	3.0995E-01 (1.180E-02)	(0.000E+00 N	% % 8	Z	1.7280E+00 (0.000E+00)	0) 1.00	1.01865+00
2 02/01/07 15:08	RA-228	39 > 301	GPC5C	<del>.</del> 5.	z z >	5.8995E-01 (1.180E-02)	1.0000E+00 N (0.000E+00)	%8 8%	z	1.9177E+00 (0.000E+00)	0 4.5045E-01 0) 1.00	1.0186E+00
3 02/02/07 06:06	RA-228	ζ.	GPC5C	ر دن	z	5.8995E-01	1.0000E+00 N	%66	z	1.0420E+01		1.0186E+00
Sq Caic Date	Parameter	50 334 A	O Net	Net Cnt Rt	N Dpm Wo Blk	(1.180E-02) (0 lk Dpm-Blk	(0.000E+00)	% 80	Yield,EnFct (	(0.000E+00) Chem Yid,EFctU IDCALCC	0) 1.00 -cc BIKLcc/MDC	WDC StdDvMdC/LcC
02/02/07	RA-228	R 0.49836 (0.199743)	4.07500E-01 (1.5837E-01)	ļ	1.086157 (0.431522)	1.086157 (0.431522)	(0.017	1.00 SA 321)	%66	0.763934	134	
02/02/07	RA-228	R -0.234113 (0.159241)	U4 -1.72500E-01 (1.1611E-01)		-0.510239 (0.346007)	-0.510239 (0.346007)	(0.017	1.00 SA 321)	%66	0.847766	.66 34	
02/02/07	RA-228	R 0.041419 (0.19918)	U4 2.75000E-02 (1.3222E-01)		0.090272 (0.434079)	0.090272 (0.434079)	(0.017	1.00 SA 321)	%66	0.940827	127 52	
02/02/07	RA-228	A 0.101889	U4 8.75000E-02		0.222063	0.222063	:	1.00 SA	%66	0.491234	34	
					(0.434300)	(0.53450)	2)	(10.0)		0.224439	38	
02/02/07	RA-228	R 1.843568 (1.145373)	U4 2.25269E-01 (1.3820E-01)	_	4.017983 (2.487225)	4.017983 (2.487225)	5) (0.017	1.00 SA 321)	%66	4.731215 2.14 <b>5</b> 099	:15 99	
Sq Status Method	Matrix F	Protocol Equation Set	Wrk Ord	Units/Matrix		QC/BB Sa/On Date	AnalysisDate/PptWt	1	Sep1/Sep2 Date (	QC/Tracer Vial Mult/Ent/td	ntYid Total/Analy Vol	ily Vol Final/Count Vol
17 Calc TF F	FILTER	STLE Ra228WoBS JMN9F2AC	JMN9F2AC 0-229	PCI/SA FILTER	S 12/	12/05/06 12:25	02/02/07 06:06 29:9		01/30/07 08:41 02/01/07 09:00	RASC4328 1 RASC4328 Alq 99	1.00 SA 99% 1.00 SA	SA
Sq Cnt Date	Parameter	Sample Cnt Bkgrnd Cnt	Cnt Instr	Geom	Trc/Av Ent	Efficiency1	Efficiency 2 Ent	Yld Fot	Ent Bili	BIk Value Ingr Fct	Conv Fct/VolAdj Decay	kdj Decay Abn
0 02/01/07 13:17	RA-228	211 ~ 248 ~	GPC5D	5: 5:	z	5.6215E-01	1.0000E+00 N	86% 7%	Z	1.5571E+00	00 4.5045E-01	1.0186E+00
1 02/01/07 14:13	RA-228	\ **	GPC5D	1.5	z - z :	5.6215E-01	1.0000E+00 N	86% 2%	z	1.7280E+00		1.0186E+00
2 02/01/07 15:08	RA-228	50 400 179 248 50 400	GPC5D	1.5	z ·	5.6215E-01 (1.259E-02)	1.0000E+00 N (0.000E+00)	86% 7%	z	1.9177E+00 (0.000E+00)		1.0186E+00
3 02/02/07 06:06	RA-228	73 , 189 <b>/</b> 50 / 334 <b>/</b>	GPC5D	ار تن	z	5.6215E-01 (1.259E-02)	1.0000E+00 N (0.000E+00)	86% 7%	z	1.0420E+01 (0.000E+00)	11 4.5045E-01 0) 1.00	1.0186E+00
() - (1s Uncertainitie IDC - Instrument Detec Sr-89 Counts are Den's	s), Q - Qualifie tion Level in Q red from the Co	() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc $\approx$ 1.445 • TPU IDC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result	c = 1.645 * TPU 1 Decision Level 30 and Y-90 Cou	in Conc Un	its, MDC-Mir	Page 11 imum Detectable C Not be Significants	Page 11 MDC-Minimum Detectable Concentration Digits May Not be Significants, Date/Time - mm/dd/yy hh.mm, 24hr Time	'dd/yy hh:mm,	24hr Time	Re	RecCnt:17	RADCALC v4.8.26 STL Richland

Sq         Calc Date         Parameter         Avg         Sa Act           02/02/07         RA-228         R 5.306322         (0.678157)           02/02/07         RA-228         R 5.790476         (0.742993)           02/02/07         RA-228         R 5.373242         (0.721901)           02/02/07         RA-228         A 5.490013         (0.412725)           02/02/07         RA-228         R 8.819285         (1.939132)	3.60000E+00 3.60000E+00 (2.9317E-01) 3.54000E+00 (2.9112E-01) 2.96000E+00 (2.7046E-01) 3.36667E+00 (1.6460E-01) 8.94132E-01 (1.7577E-01)	Dpm Wo Bik 11.564917 (1.345376) 12.620113 (1.475216) 11.710767 (1.446185) 11.965266 (0.82177) 19.221282 (4.102049)		Vol Used Yield, EnFct C 1.00 SA 86% (0.017321) 1.00 SA 86% (0.017321) 1.00 SA 86% (0.017321) 1.00 SA 86% (0.01321) 1.00 SA 86% (0.01321)	86% 1 86% 1 86% 1 86% 1	Mehd, En Fct Chem Yld, EFctU IDC/ILcC 86% 103% 0.843119 0.381841 86% 112% 0.93564 0.423743 86% 104% 1.038346 0.470258 86% 171% 5.413902 2.441099	9 8IKLCC/MDC StdDvMdC/LcC 9 1.1 1.3 1.6 1.6 1.8 1.9
RA-228 R R-228				1.00 SA 1.00 SA 1.00 SA 1.00 SA (0.01) 1.00 SA (0.01) 1.00 SA			ල - ූ හි සි සි සි සි සි සි සි සි සි සි සි සි සි
RA-228 RA-228 RA-228 R R A B B B B B B B B B B B B B B B B B				1.00 SA 1.00 SA 1.00 SA (0.01) 1.00 SA (0.01) 1.00 SA			යි කි කි කි කි වි
RA-228 R R-228				1.00 SA 1.00 SA (0.01) 1.00 SA 0.017321)			ୟ ଅଟି ବିଜ ଅଟି ବିଜ ଅଟି ବିଜ ଅଟି ବିଜ ଅଟି ବିଜ ଅଟି ବିଜ ଅଟି ବିଜ ଅଟି ବିଜ ଅଟି ବିଜ ଅଟି ବିଜ ଅଟି ବିଜ ଅଟି ବିଜ ଅଟି ବିଜ ଅଟି
RA-228 A RA-228				1.00 SA (0.01) 1.00 SA 0.017321)		_	ପ ହ
RA-228				1.00 SA 0.017321)			Ç. <b>Q</b> .
() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU   Page 12   Page 12   Instrument Detection Level in Conc Units. MLcC - Method Decision Level in Conc Units. MLcC - Method Decision Level in Conc Units.	Than Lc = 1.645 * TPU Method Decision Level in Conc Ur	nits, MDC-Minimum	Page 12 Detectable Concentrati		-	Rec	Recont 17 RADCALC v4.8.26
Sr-89 Counts are Derived from the Combination of Each Sr-89/90	Sr-89/90 and Y-90 Count, All Res	suft Digits May Not be	Significants, Date/Tirr	ie - mm/dd/yy hh:mm	, 24hr Time	mentions, is not one or entropy the sec	

### SEVERN STL

# \*\*\* RE-ANALYSIS REQUEST \*\*\* DUE DATE 2/5/07

CUSTOMER Brown I Caldwell
analysis Ra 228
MATRIX Filter
LOT NUMBER J74090287, J74100115, J74100118
SAMPLE DELIVERY GROUP N/A
OLD BATCH NUMBER 70/1229
NEW BATCH NUMBER 7829198

	LAB SAMPLE ID	REASON FOR REQUEST & ANALYSIS COMMENTS
1)	AII	LOW LCS
2)		
3)		
4)		
5)		
6)		
7)		
8)		
9)		
10)		
11)		
12)		
13)		
14)		
15)		
16)		
_17)		
18)		
19)		
20)		
	LAB QC ID	Assigned with new batch.

og 1/16/2007 7:10:55 AM			Sample Preparation/Analysis	ration/An	alvsis		Balance	Balance 14:1120373922 1120373922 1120	1120373922 1120
F 536403, Brown and Caldwell	. Brown &	BX Ra-226	BX Ra-226/228 PrpRC5016, SepRC5005	SepRC5005	•		ï	110000000000000000000000000000000000000	2114340000000000000000000000000000000000
X Caldwell		TF Radiun	TF Radium-228 by GPC				did	Pipet #:	11.0 101
디AnalyDueDate: 02/05/2007		01 STANE	01 STANDARD TEST SET				Sep1 DT/Tm Tech:	ech: 41 //	110+7.41
Batch: 7011229 FILTER SEO Batch. Test: 7011225. BXTE	pCi/sampl		PM, QL	PM, Quote: SA, 63174	174		Sep2 DT/Tm Tech	ect 1/2	5260 20/5
ND							Prep T	Prep Tech: WoodT, HarrisonJ	isonJ
Work Order, Lot, Total Amt Sample Date /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	mt fied)	OC Tracer Prep Date		Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 <b>JMK81-1-AD</b> 0.833sa,g J7A090287-1-SAMP	531.15sa,g	150.19g.in	0.2355g 1. 0090	RATA25303 01/03/07[]	150	7	181	(12K)	
						-7%	6250	calably	
									1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
12/05/2006 12:25	AmtRec	AmtRec: FiLTER	#Containers: 1			Scr:	Alpha:		Beta:
2 JMLA1-1-AD 0.833sa,g	502.71sa,g	150.39g,in	0.2492g	RATA25304	27.2	•	7	1,	
J7A090287-2-SAMP			1,0130	<del>-</del>	('/2	78	181	<6/50/,	
						$\mathcal{X}_{t_0}$	5/60	(1/20/01)	
					10	5 516			
12/05/2006 12:10	AmtRec	AmtRec: FILTER	#Containers: 1			Scr:	Alpha:		Beta:
3 JMLA4-1-AD 0.833sa,g	516.54sa.g	150.15g,in	0.2421g	RATA25305	9			7 =	
J7A090287-3-SAMP			1,0564	70/20/10	74.2	$\mathcal{C}$	100	(p/n3	
						7/	3 849	(m/b)	- 1
							`		
12/05/2006 12:45	AmtRec	AmtRec: FILTER	#Containers: 1	yaya'adan da daga pi a		Scr.	Alpha:		Beta:
4 JMLA7-1-AD 0.833sa,g J7A090287-4-SAMP	519.32sa,g	150.24g,in	0.241g	RATA25306 01/03/07	791.	7.7	121	1/3/2	
			7.00	7	)	) _	878	C12 CD/ (1/2) C//	
		2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
12/05/2006 12:30	AmtRec	AmtRec: FILTER	#Containers: 1		<b>→</b>	Sor	Alpha:		Beta:
	,			7					
STL Richland Key: In - Initial Amt,	mt, fi - Final Amt, di - Diluted Amt, s1 - Sep1,	Diluted Amt, s1	s2 · Sep2	Page 1	- ASI	ISV - Insufficient Volume for Analysis	e for Analysis		WO Cht: 4
Richland Wa. pd - Prep Dt.	pd - Prep Dt, r - Reference Dt, ec-Enrichment Cell, ct-Cock	nrichment Cell, c	ct-Cocktailed Added					Prep	Prep_SamplePrep v4.8.26

1/16/2007 /:10:5/ AM			Sample Preparation/Analysis	aration/Ana	lysis		Balance	d:1120373922,	Balance Id:1120373922,1120373922,1120
O2) 된 536403 Brown and Caldwell	Brown &	BY Da. 226	BX D2-226/228 DrnBC5016 SanDC5005	SanDreone					
Caldwelf	8	TF Radiur	DA RA-220/220 PrpRC3010, TF Radium-228 by GPC	concoudes			Pig	Pipet #:	
AnalyDueDate: 02/05/2007		01 STANDARD T	ARD TEST SET				Sep1 DT/Tm Tech:	ech:	
H Batch: 7011229 FILTER	pCi/sampl	_	PM, Q	PM, Quote: SA, 63174	74		Sep2 DT/Tm Tech:	ech:	
							Prep T	Prep Tech: WoodT,HarrisonJ	risonJ
Work Order, Lot, Total Amt Sample Date /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Time Min	Detector Id	Count On { Off (24hr) Circle	CR Analyst, Init/Date	Comments:
5 JMLA8-1-AD 0.833sa,g J7A090287-5-SAMP	500.78sa.g	150.69g.in	0.2507g • 9164	RATA25307 01/03/07 / . //	150 21.54	2	15/6	1/25/15	
						9	0849	50/m/,	
12/05/2006 12:50	AmtRe	AmtRec: FILTER	#Containers: 1			Scr.	Alpha:		Beta:
6 JMLT2-1-AD 0.833sa,g J7A100115-1-SAMP	524.49sa,g	150.01g,in	0.2382g •9678	PATA25308 01/03/07	29.9	<u>a</u>	181	co/ce/	
						A/G	6450	<6/h/ <sub>1</sub>	
12/11/2006 11:40	AmtRe	AmtRec: FILTER	#Containers: 1			Scr.	Alpha:	,	Beta:
<b>7 JMLT6-1-AD</b> 0.833sa,g J7A100115-2-SAMP	532.31sa.g	150.08g,in	0.2349g 94/73	RATA25309 01/03/07	29.7	SA	186	1/395	•
						H	620	(/2/05	
12/11/2006 12:00	AmtRe	AmtRec: FiLTER	#Containers: 1			Scr.	Alpha:		Beta:
8 JMLT7-1-AD 0.833sa,g J7A100115-3-SAMP	527.80sa.g	150.17g,in	0.2379	RATA25316 01/03/07	0,2	36	15/6	1/25005	
				3		ÖE	6250	esynU,	
				-					
12/11/2006 12:15	AmtRe	AmtRec: FILTER	#Containers: 1	·>	>	Scr.	Alpha:		Beta:
		: !	:						
STL Richland Key: In - Initial Amt, Richland Wa. pd - Prep Dt, r	In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 pd - Prep Dt, r - Reference Dt, ec-Enrichment Cell, ct-Cocktailed Added	Diluted Amt, s1 Enrichment Cell,	- Sep1, s2 - Sep2 ct-Cocktailed Added	Page 2	ISV - I	ISV - Insufficient Volume for Analysis	ne for Analysis	Pre	WO Cnt: 8 Prep_SamplePrep v4.8.26
								.:	

1/16/2007 7:10:57 AM	,		Sample Preparation/Analysis	aration/Ar	alysis		Balance	Balance Id:1120373922,1120373922,1120	203/3922.1120
536403, Brown and Caldwell	, Brown &	BX Ra-226/	BX Ra-226/228 PrpRC5016, SepRC5005	SepRC5005	•		Pipe	Pipet #:	
Caldwell		TF Radium-228 b	i-228 by GPC ARD TEST SET				Sep1 DT/Tm Tech:	ich:	
AnalyDueDate: 02/05/2007									
Batch: 7011229 FILTER	pCi/sampl		PM, Q	PM, Quote: SA, 63174	3174		Sep2 DT/Tm Tech:	ch:	
							Prep Te	Prep Tech: WoodT, HarrisonJ	con
Work Order, Lot, Total Amt Sample Date /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date		Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments
<b>9 JMLT8-1-AD</b> 0.833sa <sub>1</sub> g J7A100115-4-SAMP	503.04sa.g	150.10g,in	0.2486g • \$426	RATA25311 01/03/07	150	20	15/1	1/25/00>	
						45	5 NSO	/20,00/s	
					_	,			
12/11/2006 11:45	AmtRec	AmtRec: FILTER	#Containers: 1			Scr:	Alpha:		Beta:
10 JMLVA-1-AD 0.833g J7A100115-5-SAMP	511.47g	150.26g,in	0.24479	RATA25312 01/03/07	28.7	30	151	1/35/00	
						3/5	5750	1/26	
				1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
12/11/2006 12:20	AmtRec	AmtRec: FILTER	#Containers: 1			Scr.	Alpha:		Beta:
11 JMLVW-1-AD 0.833g J7A100118-1-SAMP	502.79g	150.23g,in	0.2489g 1,01,040	RATA25313 01/03/07	29.1	22	15/6	1/20/05	
						$\chi$	6750	sm/m/	
12/13/2006 12:10	AmtRec	AmtRec: FILTER	#Containers: 1			Scr	· Aipha:		Beta:
12 JMLV3-1-AD 0.833sa.g J7A100118-2-SAMP	507.51sa,g	150.25g,in	0.2466g 1. OGS 1	RATA25314 01/03/07	29.3	25	13/4	12/20	
						\$	629	1/2/100	
12/13/2006 12:43	AmtRec	AmtRec: FILTER	#Containers: 1			Scr	Alpha.		Beta:
,				·	>				
STL Richland Key: In - Initial Amt.	In Initial Amt, fir Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 od - Pres Dt in Reference Dt ec-Enrichment Cellict-Cocktailed Added	Diluted Amt, s1	- Sep1, s2 - Sep2	Page 3	1 - ASI	ISV - Insufficient Volume for Analysis	le for Analysis	V Prep.	WO Cnt: 12 Prep_SamplePrep v4.8.26
	i, i - neleielbe Di, ev-t	The mineral Con.	occuration raded						

1/16/2007 7:10:57 AM			Sample Preparation/Analysis	משמטולאו	alysis		Balance	Balance Id:1120373922 1120373922 1120	120373922 1120
H 536403, Brown and Caldwell	, Brown &	BX Ra-226	BX Ra-226/228 PrpRC5016, SepRC5005	SepRC5005			Pipe	Pinet #:	
Caldwell		TF Radium-228 t	TF Radium-228 by GPC				or mutanta		
AnalyDueDate: 02/05/2007		OI SI AND	2				sepi Di/im lecn:	acu:	
Batch: 7011229   FILTER   SEQ Batch, Test: 7011225, BXTE	pCi/sampl		PM, O	PM, Quote: SA, 63174	174		Sep2 DT/Tm Tech:	ch:	
							Prep T€	Prep Tech: WoodT,HarrisonJ	Puos
Work Order, Lot, Sample Date	Total Init Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
13 JMLV5-1-AD 0.833sa,g J7A100118-3-SAMP	510.86sa.g 150	150.11g,in	0.2448g	RATA25315 01/03/07	150	36	15/6	1/8(27)	
						23	LNO	(14.625	
		í.							,
Ω	AMIMEC	LEK Spenie	#Containers: 1	0.00	+	SCI:	Aipna:		Beta:
14 JMLV8-1-AD 0.853Sa,g J7A100118-4-SAMP 	504.9284.9	150.22g,III	9011	01/03/07	30,0	30	196	1/28/00	
		. !				7	08/9	1/26/115	
12/13/2006 13:18	AmtRec: FILTER	.TER	#Containers: 1			Scr:	Alpha:		Beta:
15 JMLV9-1-AD 0.833sa,g J7A100118-5-SAMP	511.81sa.g 150	150.27g,in	0.2446g	RATA25317 01/03/07	32.4	478	12/6	1/36/	· • •,
						3	GN 084	120	
12/13/2006 13:21	AmtRec: FILTER	TER	#Containers: 1			Scr.	Alpha:		Beta:
16 JMN9F-1-AA-B	152	152.17g,in	152.179	RATA25318	, 00		1	1	
J7A110000-229-BLK			0/76	01/03/07	77.12	24	15/6 164	50/50/ 50/50/	
								7	
12/05/2006 12:25	AmtHec:	#	#Containers: 1	>	<b>\$</b>	Sor:	Alpha		Beta:
					,				
Key:	In Initial Amt, fir Final Amt, di Diluted Amt, s1 - Sep1, s2 - Sep2	uted Amt, s1	- Sept. s2 - Sep2	Page 4	I- ASI	ISV - Insufficient Volume for Analysis	ne for Analysis	Pres	WO Cnt: 16
Richland Wa. pd ⋅ Prep D	Meterence Di ec-Furic	hment Call	Lapho Paliet Andort						

다 H AAnalyDueDate: 02/05/2007		BX Ra-226	BX Ra-226/228 PrpRC5016, SepRC5005	SepRC5005					
12/05/2007			000				Ϋ́	Pipet #:	
		11 Hadium-228 D 01 STANDARD T	of STANDARD TEST SET			U)	Sep1 DT/Tm Tech:	sch:	
Batch: 7011229	pCi/sampl	la.					Sep2 DT/Tm Tech:	ech:	
	٠						Prep Te	Prep Tech: ,HarrisonJ	
Total Amt /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Count Time Min	<u> </u>	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments;
17 JMN9F-1-AC-C J7A110000-229-LCS		150.10g,in	150.10g	RASC4320 11/22/06	150 33,8,	72	15/6	1665.6	.0
						22	dají	/1e/1	72
	AmtRec		#Containers: 1			Ser	Alpha:		Beta:
omments: Clients for Batch: 536403, Brown and Caldwell		Вгомп	wn & Caldwell		SA , 63174				
DWK811AD-SAMP Constituent List: Ba-133 RDL: RA-228DA RDL:3.10E+00 pc	pci/sam LCL:70 pci/sam LCL:	0 UCL:130	0 RPD:20	RA-228	RDL:3.10E+00	pCi/sam	I.C.L.:	טכנ:	RPD:
RDL: pC:	pci/sam LCL:70 pci/sam LCL:	0 UCL:130	0 RPD:20 RPD:	RA-228	RDL:3.10E+00	pCi/sam	rcr:	מכדי	RPD:
RDL: pC	pci/sam LCL:70 pci/sam LCL:70	0 UCL:130	0 RPD:20 0 RPD:20	RA-226 RA-228DA	RDL: RDL:1	pCi/sam pCi/sam	LCL:70 LCL:70	UCL:130 UCL:130	RPD:20 RPD:20
UMK811AD-SAMP Calc Info: Uncert Level (#s):: 2 Di	Decay to Sabt: Y	Y Blk Subt.:	bt.: N Sci.Not.:	×	ODRs: B				. •
TAA-BLK: Uncert Level (#s).: 2 Du	Decay to SaDt: Y		B1k Subt.: N Sci.Not.:	<b>&gt;</b>	ODRs: B				
TAC-LCS: Uncert Level (#s).: 2 Do	Decay to SaDt: Y		Blk Subt.: N Sci.Not.:	×	ODRs: B				
				Approved By	ву	:		Date:	
Key: In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2	fi - Final Amt, d	fi - Final Amt, di - Diluted Amt, s1 - Sep1,	- Sep1, s2 - Sep2	Page 5	ISV - Insuffi	ISV - Insufficient Volume for Analysis	ır Analysis		WO Cnt: 17

Batch	Nbr:	7011229	<i>F</i>	Alpha B		228 by GF		esults	1	/26/2007 7:1	0:43 AN
Status	Meth	Matrix	Wrk Ord	Paramet		mary Repo		Av ILcC	IDC	QC Yield	RYId
Ra-22	28 by (	GPC	Ra-	226/Ra-22	28 Deem Wi	th Out Blk Sul	bt.		CRDL	- 10 · · · · · · · · ·	
Calc	TF	FILTER	JMK811AD	RA-228	1.51E+00	(9.82E-01) U	I4 PCI/SA	R 1.89E+00	-1	85%	
Calc	TF	FILTER	JMK811AD	RA-228	2.39E+00	(1.15E+00)	PCI/SA	R 2.10E+00	4.59E+00	85%	
Calc	TF	FILTER	JMK811AD	RA-228	2.60E-01	(1.08E+00) U	14 PCI/SA	R 2.33E+00	5.10E+00	85%	
Calc	TF	FILTER	JMK811AD	RA-228	1.39E+00 V	(6.20E-01)	PCI/SA	A 1.22E+00	2.66E+00	85%	
Caic	TF	FILTER	JMK811AD	RA-228	1.01E-01	(5.31E+00) U	I4 PCI/SA	R 1.16E+01	2.54E+01	85%	
Calc	TF	FILTER	JMLA11AD	RA-228	1.44E+00	(9.22E-01) U	4 PCI/SA	R 1.76E+00	3.87E+00	80%	
Calc	TF	FILTER	JMLA11AD	RA-228	4.17E+00	(1.25E+00)	PCI/SA	R 1.95E+00	4.29E+00	80%	
Calc	TF	FILTER	JMLA11AD	RA-228	2.41E+00	(1.19E+00)	PCI/SA	R 2.17E+00	4.76E+00	80%	
Calc	TF	FILTER	JMLA11AD	RA-228	2.67E+00 V	(6.52E-01)	PCI/SA	A 1.13E+00	2.49E+00	80%	
Calc	TF	FILTER	JMLA11AD	RA-228	4.01E+00	(5.43E+00) U	I4 PCI/SA	R 1.12E+01		80%	
Calc	TF	FILTER	JMLA41AD	RA-228	7.06E-01	(9.00E-01) U		R 1.86E+00	4.05E+00	90%	
Calc	TF	FILTER	JMLA41AD	RA-228	-3.31E-01	(9.15E-01) U		R 2.06E+00		90%	
Calc	TF	FILTER	JMLA41AD	RA-228	1.18E+00	(1.13E+00) U		R 2.29E+00		90%	
Calc	TF	FILTER	JMLA41AD	RA-228	5.18E-01 ✓	(5.71E-01) U		A 1.19E+00			
Calc	TF	FILTER	JMLA41AD	RA-228	-4.85E+00	(4.94E+00) U		R 1.16E+01		90%	
						,					
Calc	TF	FILTER	JMLA71AD	RA-228	2.98E+00	(9.96E-01)	PCI/SA	R 1.61E+00		91%	
Calc	TF	FILTER	JMLA71AD	RA-228	8.43E-01	(8.78E-01) U		R 1.77E+00		91%	
Calc	TF	FILTER	JMLA71AD	RA-228	1.09E+00	(9.88E-01) U		R 1.96E+00		91%	
Calc	TF	FILTER	JMLA71AD	RA-228	1.64E+00 ×	(5.52E-01)	PCI/SA	A 1.03E+00			
Calc	TF	FILTER	JMLA71AD	RA-228	-1.47E+00	(4.43E+00) U	14 PCI/SA	R 9.99E+00	2.21E+01	91%	
Calc	TF	FILTER	JMLA81AD	RA-228	2.47E+00	(1.01E+00)	PCI/SA	R 1.72E+00	3.82E+00	78%	
Calc	TF	FILTER	JMLA81AD	RA-228	-2.32E <b>-0</b> 1	(8.41E-01) U	14 PCI/SA	R 1.89E+00		78%	
Calc	TF	FILTER	JMLA81AD	RA-228	1.12E+00	(1.06E+00) U			4.66E+00	78%	
Calc	TF	FILTER	JMLA81AD	RA-228	1.12E+00 °	(5.63E-01)	PCI/SA	A 1.10E+00	2.44E+00	√ 78%	
Calc	TF	FILTER	JMLA81AD	RA-228	9.52E+00	(6.01E+00) U	4 PCI/SA	R 1.14E+01	2.51E+01	78%	
Calc	TF	FILTER	JMLT21AD	RA-228	5.04E+00	(1.25E+00)	PCI/SA	R 1.73E+00	3.83E+00	84%	
Calc	TF	FILTER	JMLT21AD	RA-228	1.83E+00	(1.03E+00)	PCI/SA	R 1.91E+00	4.21E+00	84%	
Calc	TF	FILTER	JMLT21AD	RA-228	2.86E+00	(1.22E+00)	PCI/SA	R 2.12E+00	4.68E+00	84%	
Calc	TF	FILTER	JMLT21AD	RA-228	3.24E+00 N	) (6.76E-01)	PC1/SA	A 1.11E+00	2.45E+00	84%	
Calc	TF	FILTER	JMLT21AD	RA-228	1.34E+01	(5.64E+00)	PCI/SA	R 8.86E+00	2.05E+01	84%	
Calc	TF	FILTER	JMLT61AD	RA-228	3.98E+00	(1.06E+00)	PCI/SA	R 1.16E+00	2.79E+00	82%	
Calc	TF	FILTER	JMLT61AD	RA-228	2.15E+00	(8.94E-01)	PCI/SA	R 1.29E+00		82%	
Calc	TF	FILTER	JMLT61AD	RA-228	7.08E-01	(7.62E-01) U		R 1.43E+00		82%	
Calc	TF	FILTER	JMLT61AD	RA-228	2.28E+00 V	(5.26E-01)	PCI/SA	A 7.48E-01			
Calc	TF	FILTER	JMLT61AD	RA-228	1.58E+00	(4.17E+00) U		R 8.69E+00		82%	
Calc	TF	FILTER		RA-228	3.33E+00	(9.70E-01)	PCI/SA	R 1.28E+00		90%	
Calc	TF	FILTER	JMLT71AD	RA-228		(9.70E-01) (7.76E-01) U		R 1.42E+00		90%	
Calc	TF	FILTER	JMLT71AD	RA-228	1.05E+00 1.35E+00	(8.83E-01) U		R 1.57E+00		90%	
Juli	1F	IILIEN	JMLT71AD	117-220	1.336400	(0.03E-01)	71 O//3A	1.572+00	<b>₩.₩.±00</b>	<b>30</b> %	
		rtainities) nt Detection Le	evel in Conc Units		F	Page 1				RecCnt:39	
ALcC- I	Method [	Decision Level Detectable Co	in Conc Units		, U is Less Than I	_c = 1.645*TPU e Digits Reguardless	s of Significants			RADCALC	
			for Set of Blanks		mm/dd/yy hh:mm		o or organicants			STL Richlar	iū

Alpha Beta, Ra-228 by GPC , Results Batch Nbr: 7011229 1/26/2007 7:10:44 AM Summary Report Wrk Ord Status Meth Matrix Parameter Sa Act Uncert Q Units Av ILcC IDC RYId QC\_Yield TF Calc **FILTER** JMLT71AD **RA-228** 1.91E+00 (5.08E-01)PCI/SA A 8.21E-01 1.90E+00 90% Calc TF **FILTER** JMLT71AD **RA-228** -2.60E+00 (3.38E+00) U4 PCI/SA 8.16E+00 1.89E+01 90% TF Calc **FILTER** JMLT81AD RA-228 2.54E+00 (9.44E-01)PCI/SA R 1.37E+00 3.20E+00 76% Calc TF **FILTER** JMLT81AD **RA-228** PCI/SA 2.05E+00 (9.56E-01) R 1.51E+00 3.55E+00 76% Calc TF FILTER JMLT81AD RA-228 2.06E+00 (1.03E+00)PCI/SA 1.68E+00 3.94E+00 76% **FILTER** Calc TF **RA-228** PCI/SA A 8.78E-01 2.06E+00 3 76% JMLT81AD 2.22E+00 (5.65E-01) TF Calc **FILTER** JMLT81AD **RA-228** (3.75E+00) U4 PCI/SA 9.89E+00 2.25E+01 -7.12E+00 76% Calc TF **FILTER RA-228** PCI/SA R 1.01E+00 2.39E+00 JMLVA1AD 2.32E+00 (7.70E-01)93% Calc TF **FILTER** JMLVA1AD **RA-228** 2.57E+00 (8.55E-01) PCI/SA 1.12E+00 2.66E+00 93% TF Calc **RA-228** PCI/SA R 1.24E+00 2.95E+00 FILTER JMLVA1AD 1.82E+00 (8.18E-01) 93% Calc TF FILTER JMLVA1AD **RA-228** 2.24E+00 L (4.71E-01) PCI/SA 6.48E-01 1.54E+00 93% Calc TF **FILTER RA-228** (3.34E+00) U4 PCI/SA JMLVA1AD -4.44E+00 R 8.29E+00 1.88E+01 93% Calc TF **FILTER** JMLVW1AD **RA-228** 3.46E+00 (9.47E-01) PCI/SA 1.02E+00 2.41E+00 90% Calc TF **FILTER** JMLVW1AD **RA-228** (6.36E-01) U4 PCI/SA R 1.14E+00 2.68E+00 90% 8.29E-01 (6.53E-01) U4 PCI/SA Calc TF **FILTER** JMLVW1AD **RA-228** 5.80E-01 1.25E+00 2.94E+00 90% 1.62E+00 <sup>₩</sup> Calc TF FILTER JMLVW1AD **RA-228** (4.38E-01) PCI/SA Α 6.56E-01 1.55E+00 90% Calc TF **FILTER RA-228** (3.79E+00) U4 PCI/SA R 8.12E+00 1.85E+01 JMLVW1AD 7.38E-01 90% Calc TF FILTER JMLV31AD RA-228 4.12E+00 (1.09E+00)PCI/SA 1.12E+00 2.61E+00 86% Calc TF **FILTER** JMLV31AD **RA-228** 7.46E-01 (6.68E-01) U4 PCI/SA R 1.24E+00 2.89E+00 86% Calc TF FILTER JMLV31AD **RA-228** 1.49E+00 (8.28E-01) PCI/SA R 1.36E+00 3.18E+00 86% TF Calc FILTER JMLV31AD **RA-228** 2.12E+00 (5.08E-01) PCI/SA A 7.16E-01 1.67E+00 86% Calc TF FILTER JMLV31AD RA-228 2.77E+00 (3.91E+00) U4 PCI/SA R 7.86E+00 1.80E+01 86% Calc TF **FILTER RA-228** PCI/SA R 1.26E+00 2.93E+00 JMLV51AD 3.10E+00 (9.91E-01)81% Caic TF **FILTER RA-228** PCI/SA 1.40E+00 3.25E+00 JMLV51AD 1.58E+00 (8.48E-01) 81% Caic TF (8.08E-01) U4 PCI/SA **FILTER** JMLV51AD **RA-228** 8.12E-01 R 1.53E+00 3.57E+00 81% Calc TF FILTER JMLV51AD **RA-228** 1.83E+00 (5.11E-01) PCI/SA Α 8.06E-01 1.88E+00 81% Calc TF **FILTER** JMLV51AD **RA-228** (4.17E+00) U4 PCI/SA R 8.21E+00 1.89E+01 3.50E+00 81% Calc TF **FILTER RA-228** 1.33E+00 3.07E+00 79% JMLV81AD 1.43E+00 (7.87E-01) PCI/SA (7.88E-01) U4 PCI/SA Caic TF 9.17E-01 R FILTER JMLV81AD **RA-228** 1.48E+00 3.40E+00 79% Calc TF **FILTER** JMLV81AD **RA-228** -2.75E-01 **47.06E-01) U4** PCI/SA 1.62E+00 3.74E+00 79% Calc TF **FILTER** JMLV81AD **RA-228** 6.90E-01 (4.40E-01) U4 PCI/SA A 8.53E-01 1.97E+00 79% Calc TF FILTER JMLV81AD **RA-228** -6.75E+00 (3.31E+00) U4 PCI/SA R 9.00E+00 2.05E+01 79% Calc TF **FILTER** JMLV91AD **RA-228** PCI/SA R 1.00E+00 2.37E+00 88%

Calc

Calc

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JMLV91AD

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JMN9F1AA

JMN9F1AA

Page 2

(7.20E-01)

(6.86E-01)

(7.96E-01)

(4.24E-01)

(1.96E-01)

(2.97E+00) U4 PCI/SA

(1.99E-01) U4 PCI/SA

PCI/SA

PCI/SA

PCI/SA

PCI/SA

R

1.98E+00

1.31E+00

1.76E+00

1.68E+00

-5.61E+00

3.99E-01

2.78E-01

**RA-228** 

**RA-228** 

**RA-228** 

**RA-228** 

**RA-228** 

**RA-228** 

RecCnt;78 RADCALC v4.8.26 STL Richland

88%

88%

88%

88%

80%

80%

1.11E+00 2.63E+00

1.22E+00 2.89E+00

6.42E-01 1.52E+00

8.02E+00 1.84E+01

R 3.26E-01 7.53E-01 B

R 3.62E-01 8.35E-01

<sup>(1</sup>s Uncertainities)

Instrument Detection Level in Conc Units MLcC- Method Decision Level in Conc Units

MDC - Minimum Detectable Concentration \*Std - Lc, MDC using StdDev for Set of Blanks

Q - Qualifier, U is Less Than Lc = 1.645\*TPU All Results Displayed to Three Digits Reguardless of Significants Date/Time - mm/dd/yy hh:mm, 24hr Time

Batch Nbr: 7011229	Alpha Bet	a, Ra-228 by	GPC	, Re	sults	- The second of the second	1/26/2007 7:1	0:44 AM
		Summary Re	port					
Status Meth Matrix W	/rk Ord Parameter	Sa Act Uncert	Q	Units A	v ILcC	IDC	QC Yield	RYId

Status	Meth	Matrix	Wrk Ord	Parameter	Sa Act	Uncert	Q Uni	s A	v ILcC	IDC	QC	Yield	RYId
Calc	TF	FILTER	JMN9F1AA	RA-228	2.15E-01	(2.08E-01)	U4 PCI/S	A R	3.98E-01	9.18E-01	В	80%	
Calc	TF .	FILTER	JMN9F1AA	RA-228	2.98E-01 🗸	(1.16E-01)	PCI/S	A A	2.09E-01	4.82E-01	В	80%	<b>/</b> :: .
Calc	)F	FILTER	JMN9F1AA	RA-228	1.17E+00	(1.58E+00)	U4 PCI/S	A R	3.26E+00	7.14E+00	В	80%	
Calc	TF ·	FILTER	JMN9F1AC	RA-228	4.20E+00	(5.67E-01)	PCI/S	A R	2.91E-01	6.65E-01	s	93%	83%
Calc	TF	FILTER	JMN9F1AC	RA-228	3.38E+00	(5.01E-01)	PCI/S	A R	3.23E-01	7.38E-01	s	93%	67%
Caic	TF	FILTER	JMN9F1AC	RA-228	3.30E+00	(5.08E-01)	PCI/S	A R	3.55E-01	8.12E-01	s	93%	65%
Calc	TF	FILTER	JMN9F1AC	RA-228	3.62E+00	(3.04E-01)	PCI/S	A A	1.86E-01	4.26E-01	S	93% \	72%
Calc	TF	FILTER	JMN9F1AC	RA-228	3.14E+00	(1.51E+00)	PCI/S	A R	2.74E+00	6.00E+00	s	93%	62%

Angela Long 1/26/07 Panderson 1.2957

() (1s Uncertainties)
IDC - Instrument Detection Level in Conc Units
MLcC- Method Decision Level in Conc Units
MDC - Minimum Detectable Concentration
"Std - Lc, MDC using StdDev for Set of Blanks

Page 3

O - Qualifier, U is Less Than Lc  $\approx$  1 645 TPU All Results Displayed to Three Digits Reguardless of Significants Date/Time - mm/dd/yy hh:mm, 24hr Time

RecCnt:85 RADCALC v4.8.26 STL Richland

<b>Results</b> 1/26/2007 7:10:44 AM	typicoman ( mag migration )	Sept/Sep2 Date QC/Tracer Vial Mult/EntYId Total/Analy Voi Final/Count Voi	01/17/07 09:47 RATA25303 1 1.00 SA 01/25/07 09:25 RATA25303 Alq 101% 0.235542 SA	Ent Bik Value Ingr Fct Conv Fct/VolAdj Decay Abn	N 1.5445E+00 4.5045E-01 1.0143E+00 (0.000E+00) 4.245523	N 1.7140E+00 4.5045E-01 1.0143E+00	(0.000E+00) *433253 N 1.9022E+00 4.5045E-01 1.0143E+00	4.245523	N 9.6607E+00 4.5045E-01 1.0143E+00 (0.000E+00) 4.245523	Yield, EnFet Chem Yid, EFCIU IDC/ILCC BIKLC/MDC StdDvMdC/LcC	85% 4.138507 1.894526	85% 4.592797	85% 5.096956	85% 2.66125	1.218267	85% 25.430746 11.622319	Sep1/Sep2 Date QC/Tracer Vial Mult/EntYId Total/Analy Vol Final/Count Vol	01/17/07 09:47 RATA25304 1 1.00 SA 01/25/07 09:25 RATA25304 Alq 101% 0.249199 SA	Ent Bik Value Ingr Fct Conv Fct/VolAdj Decay Abn	N 1.5445E+00 4.5045E-01 1.0143E+00 (0.000E+00) 4.012856		(0.000E+00) 4.012856	N 1.9022E+00 4.5045E-01 1.0143E+00	Page 1 RecCnt: 2 RADCALC v4.8.26
C , Calculated Results	Report	AnalysisDate/PptWt Sep1/St	01/26/07 05:53 01/17/0 29.0 01/25/0	Efficiency 2 Ent YId Fct	1.0000E+00 N 85% (0.000E+00) 7%	z	(0.000E+00) /% 1.0000E+00 N 85%	(0.000E+00) 7%	1.0000E+00 N 85% (0.000E+00) 7%	Vol Used	1.00 SA (0.014142)	1.00 SA	1.00 SA	1.00 SA	(0.008165)	1.00 SA (0.014142)	1	01/26/07 05:53 01/17/0 27.3 01/25/0	Efficiency 2 Ent Yld Fct	1.0000E+00 N 80% (0.000E+00) 6%	z		1.00000E+00 N 80%	
a, Ra-228 by GPC	Populary Detailed Report	Units/Matrix QC/BB Sa/On Date	A 12/05/06 12:25	Trc/Av Ent Efficiency1	N N 5.4275E-01 1.	N 5.4275E-01	Y (1.626E-02) (4 N 5.4275E-01 1.	Y (1.626E-02) (0	N N 5.4275E-01 1. N (1.626E-02) (0	Dpm Wo Blk Dpm-Blk	(0.504743) (0.504743)	1.234466 1.234468 (0.589083)		15396	<b></b>	0.052314 0.052314 (2.735895)	Units/Matrix QC/BB Sa/On Date	A 12/05/06 12:10	Trc/Av Ent Efficiency1	N N 5.4886E-01 1.	N 5.4886E-01	(1.577E-02)	N N 5.4886E-01 1.	Page 1
Alpha Beta,	tou -	Wrk Ord	28W0BS JMK811AD PCI/SA J7A090287-1 v4.8.26 FILTER	Bkgrnd Cnt Instr Geom	5 GPC7A 1	5 GPC7A 1	5 GPC7A 1		3 GPC7A 1	Q Net Crit Rt	U4 2.32500E-01 (1.4956E-01)	3.32500Ë-01 (1.5610E-01)	7			U4 2.50000E-03 (1.3074E-01)	Wrk Ord	28WoBS JMLA11AD PCI/SA ,J7A090287-2 v4.8.26 FILTER	grnd Cnt Instr Geom	8 GPC7B 1	'8 GPC7B 1		'8 GPC7B 1	van Lc = 1.645 * TPU
6	1st analysis	Protocol Equation Set	*STLE Ra2	Parameter Sample Cnt Bkg	228 51 .315 50 400	26 (	50 400 228 41 315	50 400	228 38 303 50 400	Parameter Avg Sa Act	28 R 1.508698 (0.982164)	28 R 2.394443	Œ	∢		28 R <b>0.101472</b> (5.306706)	Protocol	STLE Raz	Parameter Sample Cnt Bkgrnd Cnt	228 46 278 50 400	228 64 278	50	228 50 278	Qualifier, U Result is Less Th
Batch Nbr: 7011229		Sq Status Method Matrix	1 Cato TF FILTER 536403,P(0812	Sq Cnt Date Par	0 01/25/07 13:40 RA-228	1 01/25/07 14:36 RA-228	2 01/25/07 15:31 RA-228		3 01/26/07 05:53 RA-228	Sq Calc Date Pare	01/26/07 RA-228	01/26/07 RA-228	01/26/07 RA-228	01/26/07 RA-228		01/26/07 RA-228	Sq Status Method Matrix	2 Calc TF FILTER 536403,P (0813	Sq Chreate Par	0 01/25/07 13:40 RA-228	1 01/25/07 14:36 RA-228		2 01/25/07 15:31 RA-228	() (1s Uncertaintities), Q - Qualifier, U Result is Less Than Lc = 1.645 • TPU

1	Ratch Nhr. 7011220	11220		The second secon	Alpha Reta	1	Ra-228 hv GPC		ted Re	Stilts		1/26/	1/26/2007 7:10:45 AM
1,12,007,05.53 PA.228		67.7					5						
Chicago   Parzen		RA-228	4	288	GPC7B 1	z		z		7		5	.0143E+00
C102607   PA.228   R. ALGARA   O. NALORIA   Dim No. Bia.   Dim Rib.   Voltaca   Volt			20	400				000E+00)	%9			4.012856	
		Parameter	Avg			Dpm Wo Bik	Орт-Вік	Vol Used	Yield	EnFct Chem Yic	1,EFetU IDC/ILcC	BIKLcC/MC	C StdDvMdC/LcC
112607   Ph.228   Ph.12828   Ph.12828   C.152648   C.1272483   C.1272483   C.1014120	01/26/07	RA-228	Œ	1.443904 (0.921957)		0.787569 (0.501208)	0.787569 (0.501208)	1.00 (0.014142)		%0	3.865984		
C112607   PA-228   PA-228   PA-240807   C14744501	01/26/07	RA-228	Œ	4.166248 (1.248538)	5.85000E-01 (1.6534E-01)	2.272 <b>4</b> 58 (0.670693)	2.272458 (0.670693)	1.00 {		%0	4.290359		
C11/2E/OT   RA-228   A 2673879   C10651869   C106518	01/26/07	RA-228	Œ	2.410587 (1.189765)	3.05000E-01 (1.4744E-01)	1.314842 (0.645344)	1.314842 (0.645344)	1.00 {		%0	4.761319 2.16776		
	01/26/07	RA-228	∢	2.673579 (0.651868)	3.71667E-01 (8.7694E-02)	1.45829 (0.352374)	1.45829 (0.352374)	1.00 <b>(</b> 0.008165)		%0	2.486005		
California   Parimeter   Proteoce   Equation Set   Wirk Old   Unitabletity   Code   Selon Date   Analysis Date   Code   Selon Date   Analysis Date   Code	01/26/07	RA-228	Œ	4.014042 (5.429986)		2.189438 (2.959571)	2.189438 (2.959571)	1.00 <b>(</b> (0.014142)		%0	24.57396£ 11.205831	10. —	
	Status Method		Protoc	ol Equation Set		1		AnalysisDate/PptWt	Sep1/Sep2		1	1	ol Final/Count Vol
Ditable   Parameter   Sample Cmt   Bigand Cmt   Insir   Goom   Ti-oldy Ent   Efficiency   Effi	Calc/ TP 36403 (20814)	ILTER	STLE		AD.		5/06 12:45	01/26/07 05:53 29.2	01/17/07 0		Alq 1		\
1.000000000000000000000000000000000000	<b>/</b>	Parameter			Instr	Trc/Av Ent		Ent				Conv Fct/VolAdj	Decay Abn
01/25/07 14:36 RA-228 38 323 GPC7C 1 N N 5.1764E-01 1.0000E+00 N 90% N 1.7140E+01 1.01  10.125/07 14:36 RA-228 48 323 GPC7C 1 N N 5.1764E-01 1.0000E+00 N 90% N 1.7140E+01 1.01  10.125/07 15:31 RA-228 48 323 GPC7C 1 N N 5.1764E-01 1.0000E+00 N 90% N 1.902E-00 4.504E-01 1.01  10.126/07 SE-32 RA-228 35 33 33 GPC7C 1 N N 5.1764E-01 1.0000E+00 N 90% N 1.902E-00 4.504E-01 1.01  10.126/07 RA-228 RA-228 35 33 33 GPC7C 1 N N 5.1764E-01 1.0000E+00 N 90% N 1.902E-00 4.504E-01 1.01  10.126/07 RA-228 RA-228 35 33 33 GPC7C 1 N N 5.1764E-01 1.0000E+00 N 90% N 1.902E-00 4.504E-01 1.01  10.126/07 RA-228 RA-228 35 33 33 GPC7C 1 N N 5.1764E-01 1.0000E+00 N 90% N 1.902E-00 4.504E-01 1.01  10.126/07 RA-228 RA-228 AA-228		RA-228	46	323	GPC7C 1	z		ĺ.,		7	1	ĺ	.0143E+00
1.902E=00   1.000E=00   1.00	1 01/25/07 14:36	RA-228	38	323	GPC7C 1	z				7		. 6	1.0143E+00
National Plane   Parameter   Avg   Sa Act   Avg   Av		RA-228	48	323	GPC7C 1	z				2	•	. 5	1.0143E+00
1.856063 4.49479 2.059806 4.98819 2.285915 2.6446 1.193534 25.291755 11.600727 RecCnt:4 RADC		RA-228	35	330	GPC1B 1	z				7		. 10	.0143E+00
4.050193 1.856063 4.49479 2.059806 4.98819 2.285915 2.60446 1.193534 25.291755 11.600727		Parameter	Ave			Dpm Wo Blk	Dpm-Blk	Vol Used	Yleld		1,EFctU IDC/ILcC	BIKLcC/M	C StdDvMdC/LcC
4.49479 2.059806 4.98819 2.285915 2.60446 1.193534 25.291755 11.600727 RecCnt.4	01/26/07	RA-228	Œ	0.706282 (0.899909)		0.374328 (0.476553)	0.374328 (0.476553)	1.00 (0.014142)		%0	4.050193	· ·	
4.98819 2.285915 2.60446 1.193534 25.291755 11.600727	01/26/07	RA-228	Œ	0.330943			-0.175399 (0.484781)	1.00 { (0.014142)		%0	4.49479 2.059806		
2.60446 1.193534 25.291755 11.600727 RecCnt.4	01/26/07	RA-228	Œ	1,179133	. •	0.624938 (0.599359)	0.624938 (0.599359)	1.00 (0.014142)		%0	4.98819		
25.291755 11.600727 RecCnt:4	01/26/07	RA-228	∢	0.518157 (0.570516)		0.274622 (0.302094)	0.274622 (0.302094)	1.00 (0.008165)		%0	2.60446 1.193534		
Recont:4	01/26/07	RA-228	Œ	-4.852576 (4.943828)		-2.571855 (2.616808)	-2.571855 (2.616808)	1.00 { (0.014142)		%0	25.29175E		
	() - (1s Uncertainitie IDC - Instrument Detec Sr-89 Counts are Deni	s), Q - Qualifie tion Level in C red from the Co	ombina	esult is Less Than L nits, MLcC - Methoc tion of Each Sr-89/6	c = 1.645 • TPU f Decision Level in Conc 30 and Y-90 Count, All F	Units, MDC- Minin tesult Digits May No	Page 2 num Detectable C ot be Significants,	Soncentration Date/Time - mm/dd/yy	/ hh:mm, 24hr	Time	RecCr	and the state of t	RADCALC v4.8.26 STL Richland

В.	The state and a section of the property of the section of	ASSESSMENT OF STREET,	STATES OF THE PERSONS IN	The state of the s	Salah Military		STATE OF THE PERSON NAMED AND ADDRESS OF THE PERSON NAMED IN			AND DESCRIPTION OF THE PERSON	l		۱	1	ı
Sq Status Method Matrix		Protocol Equation Set	quation Set	Wrk Ord	Units/Matrix		QC/BB Sa/On Date	AnalysisDate/PptWt	e/PptWt	Sep1/Sep2 Date		OC/Tracer Vial Mult/EntYld	Yid Total/Analy Vol	ly Vol Final/Count Vol	É
4 Calc TF F 536403,F-0815	FILTER .	STLE Ra	Ra228WoBS JMLA71	JMLA71AD 4 v4.8.26	PCI/SA FILTER	<b>4</b>	12/05/06 12:30	01/26/07 05:53	5:53	01/17/07 09:47 01/25/07 09:25		RATA25306 1 RATA25306 Alq 106%	1.00 SA % 0.240988 SA	SA	
Sq Cnt Date	Parameter	Sample Cnt	int Bkgmd Cnt	Ont Instr	Сеот	Trc/Av	Ent Efficiency1	Efficiency 2	Ent YI	Yld Fct Ent	t Bik Value	Ingr Fct	Conv Fct/VolAdj	dj Decay	Abn
01/25/07 13:41	RA-228	56	254	GPC1B	3 1	z >	N 5.2361E-01 (1.538E-02)	1.0000E+00 (0.000E+00)	2	91% N 7%	decention of the second	1.5451E+00 (0.000E+00)	4.5045E-01 4.149583	1.0143E+00	i
01/25/07 14:31	RA-228	38	254	GPC1B	-	z >	N 5.2361E-01 (1.538E-02)	1.0000E+00	z	91% N 7%		1.6985E+00	4.5045E-01 4.149583	1.0143E+00	
01/25/07 15:26	RA-228	S S S	254	GPC1B	-	· z >	N 5.2361E-01 (1.538E-02)	1.0000E+00 (0.000E+00)	z	91% N 7%		1.8850E+00 (0.000E+00)		1.0143E+00	
01/26/07 05:53	RA-228	20 28	239	GPC1C	-	zz	N 5.1189E-01 (1.847E-02)	1.0000E+00 (0.000E+00)	z	91% N 7%		9.6640E+00 (0.000E+00)	4.5045E-01 4.149583	1.0143 <b>E</b> +00	
Sq Calc Date	Parameter	AvgS	Sa Act	o N	Net Cnt Rt	Dpm Wo Blk	10 BIK Dpm-BIK	I-BIK Vol Used	pes	Yield,EnFct		Chem Yld,EFctU IDC/ILcC	C BIKLCC/MDC	MDC StdDvMdC/LcC	ટ્ર
01/26/07	RA-228	R 2.97 (0.9	2.976638 (0.995907)	4.85(	4.85000E-01 (1.5488E-01)	1.570102 (0.518942)	32 1.570102 142) (0.518942)		1.00 SA (0.014142)	۹ 91%	,	3.548818	8 -		
01/26/07	RA-228	R 0.84	0.843378 (0.878232)	<b>U4</b> 1.250 (1.29	1.25000E-01 (1.2957E-01)	0.44486 (0.462668)	3 0.44486 (68) (0.462668)	( <u>6</u>	1.00 SA (0.014142)	۸ 91%	,o	3.901319	Ø 10		
01/26/07	RA-228	R 1.08	1.085709 (0.987603)	U4 1,450 (1.31	1.45000E-01 (1.3110E-01)	0.572684 (0.520085)	34 0.572684 185) (0.520085)	6	1.00 SA (0.014142)	۹ 91%	vo.	4.329573	e ~		
01/26/07	RA-228	A 1.63	1.635242 (0.551612)	2.51(	2.51667E-01 (8.0251E-02)	0.862549 (0.289415)	19 0.862549 (0.289415)	œ	1.00 SA (0.008165)	۹ 91%	<b>\0</b>	2.267006	(B IO		
01/26/07	RA-228	H -1.4	-1.472511	U4 -3.75 (1.12	-3.75000E-02 (1.1267E-01)	-0.776713 (2.334583)	13 -0.776713 (83) (2.334583)		1.00 SA (0.014142)	۹ 91%	۰,0	22.088442 9.986015	2 - 2		
- 2			(				ľ				1		- 1	- 1	1
pod l		_	- 1	Wrk Ord		atrix	QC/BB Sa/On Date	`		Sep1/Sep2 Date	ð	r Vial Mult/EntYld	Yid Total/Analy Vol	ly Vol Final/Count Vol	=
5 Calc TF F 536403,000580	FILTER .	STLE Raź	Ra228WoBS JMLA81 ,J7A090287-5 v4.8.26	JMLA81AD -5 v4.8.26	PCI/SA FILTER	∢	12/05/06 12:50	01/26/07 05:53 29.5		01/17/07 09:47 01/25/07 09:25		RATA25307 1 RATA25307 Alq 91%	1.00 SA % 0.250659 SA	SA SA	
Sq Cnt Date	Parameter	Sample Cnt	int Bkgrnd Cnt	Ont Instr	Geom	Trc/Av	Ent Efficiency1	Efficiency 2	Ent YI	Yld Fct Ent	t Blk Value	Ingr Fct	Conv Fct/VolAdj Decay	dj Decay	Abn
01/25/07 13:41	RA-228	45 50	220 400	GPC1C	-	z >	N 5.1183E-01 (1.847E-02)	1.0000E+00 (0.000E+00)	z	78% N 6%		1.5451E+00 (0.000E+00)	4.5045E-01 3.989491	1.0143E+00	1
01/25/07 14:31	RA-228	26 50	220	GPC1C	-	_ z >	N 5.1183E-01 (1.847E-02)	1.0000E+00 (0.000E+00)	z	78% N 8%		1.6985E+00 (0.000E+00)	4.5045E-01 3.989491	1.0143E+00	
01/25/07 15:26	RA-228	34	220	GPC1C	-	_ z >	N 5.1183E-01 (1.847E-02)	1.0000E+00 (0.000E+00)	z	N %8%		1.8850E+00 (0.000E+00)	4.5045E-01 3.989491	1.0143 <b>E</b> +00	
01/26/07 05:53	RA-228	43 50	25 <b>6</b> 400	GPC1D	-	zz	N 5.2165E-01 (1.784E-02)	1.0000E+00 (0.000E+00)	z	78% N 6%		9.6640E+00 (0.000E+00)	4.5045E-01 3.989491	1.0143E+00	
AND THE PROPERTY OF THE PROPER			The second of Assessment				) a	Dags 3			made or a "y stephen des free property of a constant		1000 at 18		ļč

State   Parameter   Assistant   Assistant   Assistant   Control	Batch Nbr: 7011229	11229		**************************************	Alph	Alpha Beta	_	Ra-228 by GPC	C , Calculated Results	ated R	esults			1/26/2007	1/26/2007 7:10:45 AM
3.819025 1.719546 4.198364 1.890346 4.198364 1.890346 2.097853 2.439616 1.098456 2.097856 2.097916 11.38362  QC/Tracer Vial Mult/EntYld Total/Analy Vol  RATA25308 1 1.38362  QC/Tracer Vial Mult/EntYld Total/Analy Vol  RATA25308 1 1.5451E+00 4.5045E-01 1.011 (0.000E+00) 4.197319 1.6985E+00 4.5045E-01 1.011 (0.000E+00) 4.197319 1.8850E+00 4.5045E-01 1.011 (0.000E+00) 4.197319 1.8850E+00 4.5045E-01 1.011 (0.000E+00) 4.197319 2.448031 1.108051 2.448031 1.108051 2.0.474967 8.857701		Parameter	Avg		_	let Cnt Rt	Dpm We Blk			Yiel	d,EnFct	Chem Yid,EFctU	) IDC/ILcC		IDvMdC/LcC
4.198364 1.890346 4.659226 2.097853 2.439616 1.098456 2.5.097916 11.38362  QC/Tracer Vial Mult/EntYld Total/Analy Vol RATA25308 Aq 97% 0.238247 SA RATA25308 Aq 97% 0.238247 SA RATA25308 Aq 97% 0.238247 SA 1.5451E+00 4.5045E-01 1.013 (0.000E+00) 4.197319 1.6985E+00 4.5045E-01 1.013 (0.000E+00) 4.197319 1.8850E+00 4.5045E-01 1.013 (0.000E+00) 4.197319 2.6667E+00 4.5045E-01 1.013 (0.000E+00) 4.197319 2.6667E+00 4.5045E-01 1.013 (0.000E+00) 4.197319 1.734566 4.212846 1.306859 4.675297 2.116178 2.448031 1.108051 20.474967 STL R	01/26/07	RA-228	Œ	2.466633 (1.012717)	3.50	0000E-01	1.353303 (0.551154)	1.353303 (0.551154)	1.00 (0.014142)	SA	78%		3.819025 1.719546		
4.659226 2.097853 2.439616 1.098456 25.097916 11.38362  QC/Tracer Vial Mult/EntYld Total/Analy Vol  RATA25308 1 1.00 SA VALES SA SA SA SA SA SA SA SA SA SA SA SA SA	01/26/07	RA-228	α	-0.232426 (0.841041)		00000E-02 851E-01)	-0.127519 (0. <b>4</b> 61385)	-0.127519 (0.461385)	1.00 (0.014142)	SA	%82		4.198364 1.890346		
2.439616 1.098456 25.097916 11.38362  QC/Tracer Vial Mult/EntYld Total/Analy Vol RATA25308 1 1.00 SA 1.00 SA 1.00 SA 2.1 SA 2.1 SA 2.1 SA 2.1 SA 2.1 SA 2.1 SA 3.832197 1.6985E+00 4.5045E-01 1.011 (0.000E+00) 4.197319 1.6985E+00 4.5045E-01 1.011 (0.000E+00) 4.197319 1.8850E+00 4.5045E-01 1.011 (0.000E+00) 4.197319 2.6667E+00 4.5045E-01 1.011 (0.000E+00) 4.197319 3.832197 1.734566 4.212846 1.906859 4.675297 2.116178 2.448031 1.108051 20.474967 STL R.	01/26/07	RA-228	Œ	1.117741 (1.058316)		237E-01	0.613242 (0.579764)	0.613242 (0.579764)	1.00 (0.014142)	SA	%82		4.659226 2.097853		
25.097916 11.38362  QC/Tracer Vial Mult/EntYtd Total/Analy Vol  RATA25308 1 1.5451E+00 4.5045E-01 1.015 (0.000E+00) 4.197319 1.6985E+00 4.5045E-01 1.015 (0.000E+00) 4.197319 1.8850E+00 4.5045E-01 1.015 (0.000E+00) 4.197319 1.8850E+00 4.5045E-01 1.015 (0.000E+00) 4.197319 2.6667E+00 4.5045E-01 1.015 (0.000E+00) 4.197319 2.6667E+00 4.5045E-01 1.015 2.106859 4.212846 1.906859 4.675297 2.116178 2.448031 1.108051 20.474967 STL R	01/26/07	RA-228	4	1.117316 (0.563025)	1.50 (7.1	0000E-01 589E-02)	0.613009 (0.307819)	0.613009 (0.307819)	1.00 (0.008165)	SA	%82		2.439616 1.098456		
### Contracer Vial Mult/Ent/tid Total/Analy Vol  ###################################	01/26/07	RA-228	Œ	9.515184 (6.008134)	••	0000E-01	5.220449 (3.285146)	5.220449 (3.285146)	1.00 (0.014142)		%82		25.097916 11.38362		
Bik Value Ingr Fct Conv FctVolAdj Dec 1.5451E+00 4.5045E-01 1.01 (0.000E+00) 4.197319 1.6985E+00 4.5045E-01 1.01 (0.000E+00) 4.197319 1.8850E+00 4.5045E-01 1.01 (0.000E+00) 4.197319 1.01 (0.000E+00) 4.197319 1.01 (0.000E+00) 4.197319 1.734566 4.212846 1.906859 4.675297 2.116178 2.448031 1.108051 20.474967 8.857701 STL RADC	Status Method		Protoc	ol Equation Set	Wrk Ord	Units/M	atrix	Sa/On Date	AnalysisDate/PptWt	Sep1/Sep.		1	Mult/Entyld	1	hal/Count Vol
Bik Value Ingr Fct Conv FctVolAdj Dec 1.5451E+00 4.5045E-01 1.01 (0.000E+00) 4.197319 1.6985E+00 4.5045E-01 1.01 (0.000E+00) 4.197319 1.8850E+00 4.197319 9.6667E+00 4.197319 9.6667E+00 4.197319 1.01 (0.000E+00) 4.197319 1.01 (0.000E+00) 4.197319 4.212846 4.212846 1.906859 4.675297 2.116178 2.448031 1.108051 20.474967 8.857701 STL RADC	Calc TF 36403,P-0816		*STLE	Ra228WoBS J7A100115-	JMLT21AE 1 v4.8.26	}		1/06 11:40	01/26/07 05:54 29.9	01/17/07 01/25/07	09:47 09:25	RATA25308 RATA25308 A	<b> </b> _	1.00 SA 0.238247 SA	
1.5451E+00 4.5045E-01 1.01 (0.000E+00) 4.197319 1.6985E+00 4.5045E-01 1.01 (0.000E+00) 4.197319 1.8850E+00 4.5045E-01 1.01 (0.000E+00) 4.197319 9.6667E+00 4.5045E-01 1.01 (0.000E+00) 4.197319 1.734566 4.212846 1.306859 4.675297 2.116178 2.448031 1.108051 20.474967 8.857701 STL RADC		Parameter					Ent		E	Yld Fct					Abn
1.6985E+00 4.5045E-01 1.01 (0.000E+00) 4.197319 1.8850E+00 4.5045E-01 1.01 (0.000E+00) 4.197319 9.6667E+00 4.5045E-01 1.01 (0.000E+00) 4.197319 1 chem Yid,EFCtU IDC/ILcC BIKLcC/MDC 3.832197 1.734566 4.212846 1.906859 4.675297 2.116178 2.448031 1.108051 20.474967 8.857701 STL R		RA-228	89 05	245	GPC1	l _	z		_	84%	z	1.54	1	5	00+3
1.8850E+00 4.5045E-01 1.01 (0.000E+00) 4.197319 9.6667E+00 4.5045E-01 1.01 (0.000E+00) 4.197319 1.01 (0.000E+00) 4.197319 1.734566 4.212846 1.906859 4.675297 2.116178 2.448031 1.108051 20.474967 8.857701 STL PRADC		RA-228	43	245	GPC1	D 1	z	-		84% 7%	z	1.6(		5	00+=
9.6667E+00 4.5045E-01 1.01 (0.000E+00) 4.197319 t Chem Yid,FCtU iDC/ILcC BIKLcC/MDC 3.832197 1.734566 4.212846 1.906859 4.675297 2.116178 2.448031 1.108051 20.474967 8.857701 RADC		RA-228	48	245	GPC1	-	z			84% 7%	z	1.8(	-	5	00+1
3.832197 3.832197 1.734566 4.212846 1.906859 4.675297 2.116178 2.448031 1.108051 20.474967 8.857701 RecCnt:7 RADC		RA-228	27	111	GPC2	<b>۲</b>	z			84%	z	9.6(		5	00+1
3.832197 1.734566 4.212846 1.906859 4.675297 2.116178 2.448031 1.108051 20.474967 8.857701		Parameter	Avg	Sa Ac		let Cnt Rt	Dpm Wo Blk			Yiel	d,EnFct	Chem Yid,EFctl	) IDC/ILeC		fDvMdC/LcC
4.212846 1.906859 4.675297 2.116178 2.448031 1.108051 20.474967 8.857701	01/26/07	RA-228	æ	5.035622 (1.250711)	7.47	7500E-01	2.631131 (0.63904)	2.631131 (0.63904)	1.00 (0.014142)	SA	84%		3.832197 1.734566		
4.675297 2.116178 2.448031 1.108051 20.474967 8.857701	01/26/07	RA-228	æ	1.832926 (1.030447)	2.47 (1.30	7500E-01 1686E-01)	0.95771 (0.536107)	0.95771 (0.536107)	1.00 (0.014142)	SA	84%		4.212846		
2.448031 1.108051 20.474967 8.857701 RecCnt:7	01/26/07	RA-228	Œ	2.855999	3.47	7500E-01 398E-01)	1.49227 (0.631792)	1.49227 (0.631792)	1.00 (0.014142)	SA	84%		4.675297 2.116178		
20.474967 8.857701 RecCnt:7	01/26/07	RA-228	∢	3.241516 (0.675787)	4.47	7500E-01 046E-02)	1.693704 (0.348798)	1.693704 (0.348798)	1.00 (0.008165)	SA	84%		2.448031		
RecCnt:7	01/26/07	RA-228	Œ	13.415996 (5.639012)	2.62	2500E-01 1721E-01)	7.009906 (2.923802)	7.009906 (2.923802)	1.00 (0.014142)	8A	84%		20.474967 8.857701		
RecCnt:7								í					A CALLED TO SERVICE OF THE SERVICE O	determination with Tong & Market	
	() - (1s Uncertainitie IDC - Instrument Deter Sr-89 Counts are Deriv	<ul><li>s), Q - Qualifier</li><li>ction Level in Qued from the Co</li></ul>	ombina	esult is Less Than Laits, MLcC - Method tion of Each Sr-89/9	c = 1.645 • Ti   Decision Lev   0 and Y-90 C	PU vel in Conc Ul Count. All Reg	nits, MDC-Mini sult Digits May N	Page 4 mum Detectable lot be Significants	Concentration s, Date/Time - mm/dd/s	w hh:mm, 24t	r Time		Recont		C v4.8.26 land

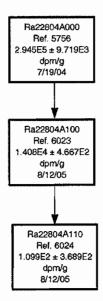
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Sq Status Method	Matrix F	Protocol E	Protocol Equation Set	Wrk Ord	Units/Matrix		OC/BB Sa/On Date	Analysis Date/PptWt		Sep1/Sep2 Date	QC/Tracer Vial	Vial MulvEntYld	YId Total/Analy Vol	ty Vol Final/Count Vol
16 Calc TF P.	FILTER	STLE R	'STLE Ra228WoBS JM!	JMN9F1AA	PCI/SA FILTER	<b>6</b>	12/05/06 12:25	01/26/07 06:51 29.6		01/17/07 09:47 01/25/07 09:25	RATA25318 RATA25318 Alq	318 1 318 Alq 93%	1.00 SA	SA SA
Sq Cnt Date	Parameter	Sample Cnt	Cnt Bkgrnd Cnt	Ont finstr	Geom	Trc/Av Ent	nt Efficiency1	Efficiency 2 Ent	nt YId Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VofAdj Decay	dj Decay
01/25/07 13:36	RA-228	25	114	GPC4B	-	z	4.7227E-01	1.0000E+00 N	80% 80%	2	The state of the s	1.5321E+00	4.5045E-01	1,0143E+00
101701101	000	2 2	9 7	0.00	•			1 0000E:00		2		4 7000 - 00		00.
01/25/07 14:31	HA-228	2 B	400	GF C4	_	z z >		(0.000E+00)		Z		(0.000E+00)	4.5045E-01	1.0143E+00
01/25/07 15:22	RA-228	19	114	GPC4B	-	z	4.7227E-01	1.0000E+00 N	80%	z		1.8691E+00	4.5045E-01	1.0143E+00
		20	400			>	(9.011E-03)	(0.000E+00)	%9			(0.000E+00)	1.00	
01/26/07 06:51	RA-228	50	303	GPC7A	+	z z z	5.4089E-01 (1.620E-02)	1.0000E+00 N (0.000E+00)	%9 %9	z		1.0765E+01 (0.000E+00)	4.5045E-01 1.00	1.0143E+00
Sq Calc Date	Parameter	Avg	Sa Act	O Net	Net Cnt Rt	Dpm Wo Bik	Bik Opm-81k	Bik Vol Used	2	Yield, EnFct		Chem YId, EFctU IDC/ILcC	C BIKLCC/MDC	MDC StdDvMdC/LcC
01/26/07	RA-228	R 0.3	0.399246 (0.196123)	2.150	2.15000E-01 (1.0350E-01)	0.873869 (0.426776)	0.873869	9 1.00	1.00 SA 7321)	%08		0.752564	4 0	
01/26/07	RA-228	я 9 6	0.278199 (0.198589)	<b>U4</b> 1.350 (9.54)	1.35000E-01 (9.5459E-02)	0.608922 (0.433475)	0.608922 (0.433475)	2 1.00 75) (0.017321)	1.00 SA 7321)	%08		0.835148 0.361943	<b></b>	
01/26/07	RA-228	в 6 9	0.215215 (0.207615)	U4 9.500 (9.11)	9.50000E-02 (9.1173E-02)	0.471063 (0.453743)	0.471063	3 1.00 43) (0.017321)	1.00 SA 7321)	%08		0.918103 0.397895	Ø 10	
01/26/07	RA-228	A 9.2	0.297554 (0.115953)	1.483	1.48333E-01 (5.5914E-02)	0.651285 (0.252965)	0.651285	(6	1.00 SA (0.01)	%08		0.482244	4 m	
01/26/07	RA-228	т. 1.	1.16769	<b>U4</b> 1.025	1.02500E-01	2.555839	2.555839	9 1.00 34) (0.012321)	1.00 SA	%08		7.137685	w. w	
HALL STANDARD STANDAR	Ì	اخ	510023)	2	,		1				A straight of the straight of the	0.50500	- 1	ě
Status Method Matrix		Protocol E	Protocol Equation Set	Wrk Ord	Units/Mai	¥	QC/BB Sa/On Date	AnalysisDate/PptWt		Sep1/Sep2 Date	QC/Tracer	QC/Tracer Vial Mull/EntYld	Tota	ly Vol Final/Count Vol
17 Calc TF F	FILTER	STLE R	Ra228WoBS JMN J7A110000-229	JMN9F1AC 0-229	PCI/SA FILTER	ဟ	12/05/06 12:25	01/26/07 06:51 30.8		01/17/07 09:47 01/25/07 09:25	RASC4320 RASC4320 Alq	20 1 20 Alq 104%	1.00 SA 1.00 SA	SA SA
Sq Cnt Date	Parameter	Sample Cnt	Cnt Bkgrnd Cnt	Ont Instr	Geom	Trc/Av Er	Ent Efficiency1	Efficiency 2 Ent	nt Yid Fct	Ent	Blk Value	Ingr Fct	Conv Fct/VolAdj	dj Decay
01/25/07 13:36	RA-228	151	129	GPC4C	-	z z >	4.8160E-01 (1.241E-02)	1.0000E+00 N (0.000E+00)	93%	z		1.5321E+00 (0.000E+00)	4.5045E-01 1.00	1.01 <b>43</b> E+00
01/25/07 14:31	RA-228	114	129	GPC4C	-	z z >	4.8160E-01 (1.241E-02)	1.0000E+00 N (0.000E+00)	83% 7%	z		1.7002E+00 (0.000E+00)	<b>4</b> .5045 <b>E</b> -01 1.00	1.0143E+00
01/25/07 15:22	RA-228	103	129	GPC4C	-	z z >	4.8160E-01 (1.241E-02)	1.0000E+00 N (0.000E+00)	93% 7%	z		1.8691E+00 (0.000E+00)	4.5045 <b>E</b> -01 1.00	1.0143E+00
01/26/07 06:51	RA-228	52	288	GPC7B	<del>-</del>	zz	5.3695E-01 (1.543E-02)	1.0000E+00 N (0.000E+00)	93%	z		1.0765E+01 (0.000E+00)	4.5045E-01 1.00	1.0143E+00
· (1s Uncertainitie	s). O - Qualifie	r U Result	s Less Than Lo	= 1 645 · TPI			Page 11	0 - (1s Uncertainities). Q - Qualifier 1) Result is Less Than Lc = 1 645 · TPU				Rec(	RecCnt:17	RADCALC v4.8.26
	3/1	יי כי ובפתור	ואוו דר	2										

Batch Nbr: 7011229	011229		-	⋖	Alpha Beta,		Ra-228 by GPC	, Calculated Results	Hesult	S		1/26/2007 7:10;47 AM	47 AM
Sq Calc Date	Parameter	Avg	Sa Act	o	Net Cnt Rt	Dpm Wo Bik	Dpm-Blk	Vol Used	Yield,EnFct	Yield, EnFct Chem Yld, EFctU IDC/ILcC	etU IDC/ILcC	BIKLCC/MDC StdDvMdC/LcC	1C/LcC
01/26/07	RA-228	Œ	4.196371 (0.567288)		2.69750E+00 (2.4740E-01)	9.185009 (1.142604)	9.185009 (1.142604)	1.00 SA (0.017321)	%86	83%	0.665275		
01/26/07	RA-228	Œ	3.379358 (0.500948)		1.95750E+00 (2.1542E-01)	7.396732 (1.024237)	7.396732 (1.024237)	1.00 <b>SA</b> (0.017321)	%86	%29	0.73828 0.322547		
01/26/07	RA-228	œ	3.2975 (0.508478)		1.73750E+00 (2.0495E-01)	7.217563 (1.045376)	7.217563 (1.045376)	1.00 SA (0.017321)	%86	65%	0.811613 0.354585		
01/26/07	RA-228	∢	3.62441 (0.303921)		2.13083E+00 (1.2894E-01)	7.933101 (0.618907)	7.933101 (0.618907)	1.00 SA (0.01)	%86	72%	0.426309		
01/26/07	RA-228	Œ	3.137171 (1.506917)		3.20000E-01 (1.5033E-01)	6.866635 (3.278263)	6.866635 (3.278263)	1.00 SA (0.017321)	%66	)%	6.0018 2.736846		e ys gystlant - All
•													
- (1s Uncertainiti	ies), Q - Qualifier, ection Level in Cor	U Be	sult is Less Than its, MLCC - Meth	Lc = 1.6 od Decisi	145 · TPU	hits, MDC-Minim	Page 12	() - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 · TPU  () - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 · TPU  () - Instrument Detection Level in Conc. Units, MLC - Method Decision Level in Conc. Units, MDC- Minimum Detectable Concentration  () - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 · TPU  () - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 · TPU  () - (1s Uncertainities), Q - Qualifier, U Result is Less Than Lc = 1.645 · TPU	out Time	44	RecCnt:17	RADCALC v4.8.26 STL Richland	8.26
9 Counts are De.	rived from the Can	mbina	ion of Each Sr-8	3/90 and	Y-90 Count, All He	sult Digits may no	of be Significants, Day	te/Time - mmraayy m.m	IM, 24fir 11ffe				

# RADIUM 228 STANDARDS AND TRACEABILITY

657

#### Ra22804A000



STL RICHLAND 658

# ISOTOPE DILUTION RECORD

1) Prepared byTDA	2) Date Prepared	10/12/2005
3) Source Identification Number / Ref. Number	RA22804A100	6023
4) Source Activity (dpm ± dpm/g)	1.4082E+04 ±	4.667E+02
5) Percent error of Source Activity	3.314 %	
6) Weight of Source Material used (g)	1.0212	
7) (% Error) of Weight of Source Material used	0.4700%	
8) Diluent	1 M HCL	
9) Total Weight of the Dilution (g)	130.8	
10) (% Error) of Total Weight of the Dilution	0.2294 %	
11) Specific Activity of Diluted Solution dpm/g	1,0994E+02 ±	3.689E+00
12) Total Uncertainty	3.355 %	
13) Dilution Identification Number / Ref. Number	RA22804A110	6024
14) Calibration Reference Date	7/19/2004	
15) Isotope Inventory File update by/date	tda	10/12/2005
16) Reviewed by/date	sew	10/31/2005
17) Location gclab	18) Exhausted	
<b>4</b> ************************************	****************	
CALCULATIONS	;	
7) % Error of Wt. used = (0.0048 / Weight of Source Material used	* 100)	
10) % error of Dilution Wt. = (0.3 / Total Weight of Dilution * 100)		
11) Specific Activity = Source Activity * Wt. of Source Material used	1 / Total Wt. of the Dilution	
12) % Total Uncertainty = (% error of Source Activity ^2 + 9	% error of Wt. Used^2 + % error o	f Dilution Wt.^2)

Form: CC-006, 7/15/99, Rev 3

# ISOTOPE DILUTION RECORD

1) Prepared by TDA		2) Date Prepared			10/12/2005
3) Source Identification Number / Ref. Number		RA22804A000	.,*		5756
4) Source Activity (dpm ± dpm/g)	٠.	2.9453E+05	_	±	9.719E+03
5) Percent error of Source Activity		3.3	_%	,	
6) Weight of Source Material used (g)	,	4.967	_		
7) (% Error) of Weight of Source Material used		0.0966	_%		
8) Diluent		1 M HCL	_		
9) Total Weight of the Dilution (g)		103.89	_		
10) (% Error) of Total Weight of the Dilution		0.2888	_%		
11) Specific Activity of Diluted Solution dpm/g		1.4082E+04	_	±	4.667E+02
12) Total Uncertainty		3.314	_%		
13) Dilution Identification Number / Ref. Number	r	RA22804A100			6023
14) Calibration Reference Date		7/19/2004	-		
15) Isotope inventory File update by/date		tda	_		10/12/2005
16) Reviewed by/date		SEW	_		1/17/2006
17) Locationqclab		18) Exhausted			
*************************	*****	*****	*****	***	
CALCULATIO	ONS			**	
7) % Error of Wt. used = (0.0048 / Weight of Source Material used)	sed:* 10	0)			4 5 x 5
10) % error of Dilution Wt. = (0.3 / Total Weight of Dilution * 10	0).				
11) Specific Activity = Source Activity * Wt. of Source Material	used / T	otal Wt. of the Dilution	7		100
12) % Total Uncertainty = (% error of Source Activity ^	2 + % er	ror of Wt. Used^2 + 9	% ėrro	or of Di	lution Wt.^2)

Form: CC-006, 7/15/99, Rev 3

#### ISOTOPE DILUTION RECORD

1) Prepared by W.G	2) Date Prepared	10/17/2002
3) Source Identification Number / Ref. Number	RA22801A000	5025
4) Source Activity (dpm ± dpm/g)	2.7299E+04 ±	1.092E+03
5) Percent error of Source Activity	4.0 %	
6) Weight of Source Material used (g)	0.3819	
7) (% Error) of Weight of Source Material used	1.2569 %	
8) Diluent	1M HCL-5122	
9) Total Weight of the Dilution (g)	121.17	
10) (% Error) of Total Weight of the Dilution	%	
11) Specific Activity of Diluted Solution dpm/g	8.6040E+01 ±	3.614E+00
12) Total Uncertainty	4.200 %	
13) Dilution Identification Number / Ref. Number	RA22801A200	5307
14) Calibration Reference Date	10/17/2002	
15) Isotope Inventory File update by/date	W.G	10/17/2002
16) Reviewed by/date	SEW	10/31/2002
17) Location QCLAB/STWT0678	18) Exhausted	-
CALCULATIONS	***********	•
7) % Error of Wt. used = (0.0048 / Weight of Source Material used *	100)	
10) % error of Dilution Wt. = (0.3 / Total Weight of Dilution * 100)		
11) Specific Activity = Source Activity * Wt. of Source Material used	/Total Wt. of the Dilution	
12) % Total Uncertainty = (% error of Source Activity ^2 + %		of Dilution Wt.^2)

Form: <u>CC-006, 7/15/99, Rev 3</u>

# ISOTOPE DILUTION RECORD

1) Prepared by W.G	2) Date Prepared	3/19/2002
3) Source Identification Number / Ref. Number	RA22801A100	5032
4) Source Activity (dpm ± dpm/g)	1.9600E+03 ±	8.402E+01
5) Percent error of Source Activity	4.287 %	
6) Weight of Source Material used (g)	4.4028	
7) (% Error) of Weight of Source Material used	0.1090 %	
8) Diluent	1M HCL-5122	
9) Total Weight of the Dilution (g)	121.34	
10) (% Error) of Total Weight of the Dilution	0.2472 %	
11) Specific Activity of Diluted Solution dpm/g	7.1118E+01 ±	3.055E+00
12) Total Uncertainty	4.296 %	
13) Dilution Identification Number / Ref. Number	RA22801A110	5123
<ul><li>13) Dilution Identification Number / Ref. Number</li><li>14) Calibration Reference Date</li></ul>	<b>RA22801A110</b> 3/19/2002	5123
		<b>5123</b> 3/19/2002
14) Calibration Reference Date	3/19/2002	
<ul><li>14) Calibration Reference Date</li><li>15) Isotope Inventory File update by/date</li></ul>	3/19/2002 W.G	3/19/2002
<ul><li>14) Calibration Reference Date</li><li>15) Isotope Inventory File update by/date</li><li>16) Reviewed by/date</li></ul>	3/19/2002 W.G SEW	3/19/2002
<ul><li>14) Calibration Reference Date</li><li>15) Isotope Inventory File update by/date</li><li>16) Reviewed by/date</li></ul>	3/19/2002 W.G SEW	3/19/2002
<ul> <li>14) Calibration Reference Date</li> <li>15) Isotope Inventory File update by/date</li> <li>16) Reviewed by/date</li> <li>17) Location QCLAB/STWT0558</li> </ul>	3/19/2002 W.G SEW 18) Exhausted	3/19/2002
14) Calibration Reference Date 15) Isotope Inventory File update by/date 16) Reviewed by/date 17) Location QCLAB/STWT0558  CALCULATIONS	3/19/2002 W.G SEW 18) Exhausted	3/19/2002
<ul> <li>14) Calibration Reference Date</li> <li>15) Isotope Inventory File update by/date</li> <li>16) Reviewed by/date</li> <li>17) Location QCLAB/STWT0558</li> <li>CALCULATIONS</li> <li>7) % Error of Wt. used = (0.0048 / Weight of Source Material used * 100</li> </ul>	3/19/2002  W.G  SEW  18) Exhausted	3/19/2002

Form: CC-006, 7/15/99, Rev 3

# ISOTOPE DILUTION RECORD

1) Prepared by W.G	2) Date Prepared	10/25/2001
3) Source Identification Number / Ref. Number	RA22801A000	5025
4) Source Activity (dpm ± dpm/g)	3.0707E+04 ±	1.228E+02
5) Percent error of Source Activity	4.0 %	
6) Weight of Source Material used (g)	1.3397	
7) (% Error) of Weight of Source Material used	%	
8) Diluent	1M HCL-5031	
9) Total Weight of the Dilution (g)	20.01	
10) (% Error) of Total Weight of the Dilution	1.4993 %	
11) Specific Activity of Diluted Solution dpm/g	2.0559E+03 ±	8.813E+01
12) Total Uncertainty	4.287 %	
13) Dilution Identification Number / Ref. Number	RA22801A100	5032
14) Calibration Reference Date	10/25/2001	
15) Isotope Inventory File update by/date	W.G	10/25/2001
16) Reviewed by/date	RROSS	10/29/2001
17) Location QCLAB/STWT0496	18) Exhausted	and the second s
**************************	****************	
CALCULATIONS		
7) % Error of Wt. used = (0.0048 / Weight of Source Material used *	100)	
10) % error of Dilution Wt. = (0.3 / Total Weight of Dilution * 100)		
11) Specific Activity = Source Activity * Wt. of Source Material used	/ Total Wt. of the Dilution	
12) % Total Uncertainty = (% error of Source Activity \( \times \) + %	6 error of Wt. Used^2 + % error of	Dilution Wt A2)

Form: <u>CC-006, 7/15/99, Rev 3</u>

SEVERN
TRENT
SERVICES

#### ISOTOPE RECORD FORM

1) Isotope	RA-228	2) Reference Number	5025		
3) Half Life	5.75 yrs	4) Storage Location	РМ		
5) Source Ider	ntification Number_	RA22801.	RA22801A000		
****************					
	· ·	LIBRATION DATA			
6) Activity as Re	ceived Units	2575 d	os		
7) Overall Uncei	rtainty Percent	4.0%			
8) Reference Da	ate / Time	10/12/01 12:00 E	ST (9.00AM)		
9) Activity dpm	√g	30839.62 ± 123	3.58 dpm/g		
10) Volume or M	ass (ml/g)	5.00978	9 g		
11) Calibrated by	,	ANALYT	ICS		
12) Certificate Solution Number 62588-310					
******	******	*******	*****		
	,	SURVEY DATA			
13) Date Receive	ed	10/	16/2001		
14) Surveyed by			W.G		
15) Survey Read	ling (Beta/Gamma) c	epm	<200CPM		
16) Survey Read	ling (Alpha) cpm		<200CPM		
******	*******	**********	*******		
17) Activity Conversion2575.0 dps*60s/m/5.00979g=30839.62 ± 1233.58dpm/g					
18) Remarks Transferred to acid leach vial 10/25/01 stwt0495					
19) Isotope File l	Jpdated by	10/17/10 W.G			
20) QC Approved		RROSS 10,	/23/01		

# RADIUM 228 CONTINUING CALIBRATION

Quality Assurance Report. Generated 6-FEB-2007 16:07:05.29

QA Filename : \$DISK1:[QUAD7.QA]CHK.QAF;2

-- Multi-Test Full Report --

Description : quad 7a 1" beta %eff

Parameter Units: percent Parameter Type: Generic

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 42.000000 Upper Bound : 44.540001

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 43.265854 Std Deviation : 0.424905

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

42.8000 1-JAN-2007 11:48 CHK 1-JAN-2007 12:12 CHK No Value 2-JAN-2007 04:50 CHK 43.6000 3-JAN-2007 04:49 CHK 42.7000 4-JAN-2007 04:34 CHK 43.3000 5-JAN-2007 04:31 CHK 43.7000 5-JAN-2007 04:48 CHK No Value 6-JAN-2007 06:25 CHK 43.2000 43.1000 8-JAN-2007 04:56 CHK 9-JAN-2007 04:54 CHK 43.5000 10-JAN-2007 04:54 CHK 43.0000 11-JAN-2007 04:59 CHK 43.4000 12-JAN-2007 04:42 CHK 43.2000 13-JAN-2007 06:04 CHK 43.1000 15-JAN-2007 04:58 CHK 43.2000 16-JAN-2007 04:50 CHK 42.9000 16-JAN-2007 05:09 CHK No Value 17-JAN-2007 04:45 CHK 42.3000 In 18-JAN-2007 04:47 CHK 43.0000 18-JAN-2007 05:05 CHK No Value 19-JAN-2007 04:49 CHK 42.3000 |In|

8-JAN-2007 04:56 CHK	44.3000	111
9-JAN-2007 04:54 CHK	44.3000	
10-JAN-2007 04:54 CHK	44.0000	
11-JAN-2007 04:59 CHK	44.6000	ÌÌÌ
12-JAN-2007 04:42 CHK	44.9000	ÌÌÌ
13-JAN-2007 06:04 CHK	44.2000	ÌÌÌ
15-JAN-2007 04:58 CHK	43.9000	İİİ
16-JAN-2007 04:50 CHK	44.4000	ÌÌÌ
16-JAN-2007 05:09 CHK	No Value	
17-JAN-2007 04:45 CHK	44.3000	
18-JAN-2007 04:47 CHK	43.9000	ÌÌÌ
18-JAN-2007 05:05 CHK	No Value	
19-JAN-2007 04:49 CHK	45.0000	
20-JAN-2007 06:56 CHK	44.8000	
21-JAN-2007 07:12 CHK	45.1000	ÌÌÌ
22-JAN-2007 05:04 CHK	44.2000	ÌÌÌ
23-JAN-2007 04:55 CHK	44.3000	
24-JAN-2007 04:42 CHK	44.6000	
25-JAN-2007 04:46 CHK	45.8000	
25-JAN-2007 05:04 CHK	No Value	
26-JAN-2007 04:52 CHK	44.3000	
27-JAN-2007 07:26 CHK	45.2000	
29-JAN-2007 05:08 CHK	44.5000	
30-JAN-2007 05:02 CHK	44.0000	
31-JAN-2007 05:03 CHK	44.2000	
1-FEB-2007 05:00 CHK//	44.3000	
2-FEB-2007 04:59 CHK	45.5000	

# -- Multi-Test Full Report --

Description : quad 7c 1) beta %eff

Parameter Units : percent Parameter Type : Generic

---- Lower/Upper Bounds Test Parameters ----

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 40.844910 Std Deviation : 0.739721

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

669

Description : quad 7d 1" beta %eff

Parameter Units: percent Parameter Type: Generic

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 17.680000 Upper Bound : 52.099998

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 34.890854 Std Deviation : 5.735348

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
1-JAN-2007 11:48	CHK	27.2000	 	<del></del>
1-JAN-2007 12:12	CHK	No Value		
2-JAN-2007 04:50	CHK	28.6000		
3-JAN-2007 04:49	CHK	30.6000		
4-JAN-2007 04:34	CHK	30.4000		
5-JAN-2007 04:31	CHK	28.1000		
Quality Assurance M	Inlti-Test Full l	Report (continued)		Page · 4

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
Measurement Time	Sample 1D	Sample Analysi	v aruc	rolanionina kei

5-JAN-2007 04:48 CHK	No Value
6-JAN-2007 06:25 CHK	40.9000
8-JAN-2007 04:56 CHK	27.3000
9-JAN-2007 04:54 CHK	29.4000
10-JAN-2007 04:54 CHK	30.7000
11-JAN-2007 04:59 CHK	29.4000
12-JAN-2007 04:42 CHK	26.9000
13-JAN-2007 06:04 CHK	27.0000
15-JAN-2007 04:58 CHK	25.8000
16-JAN-2007 04:50 CHK	24.0000
16-JAN-2007 05:09 CHK	No Value
17-JAN-2007 04:45 CHK	24.7000
18-JAN-2007 04:47 CHK	26.1000
18-JAN-2007 05:05 CHK	No Value
19-JAN-2007 04:49 CHK	26.1000
20-JAN-2007 06:56 CHK	27.5000
21-JAN-2007 07:12 CHK	43.7000
22-JAN-2007 05:04 CHK	26.7000
23-JAN-2007 04:55 CHK	27.5000

24-JAN-2007 04:42 CHK	27.7000	
25-JAN-2007 04:46 CHK	27.4000	
25-JAN-2007 05:04 CHK	No Value	
26-JAN-2007 04:52 CHK	27.3000	
27-JAN-2007 07:26 CHK	26.3000	
29-JAN-2007 05:08 CHK	26.4000	
30-JAN-2007 05:02 CHK	27.1000	
31-JAN-2007 05:03 CHK	28.1000	
1-FEB-2007 05:00 CHK	25.2000	
2-FEB-2007 04:59 CHK	35.1000	

Quality Assurance Report.

Generated 6-FEB-2007 16:07:06.34

QA Filename : \$DISK1:[QUAD7.QA]BKG\_1.QAF;2

-- Multi-Test Full Report --

Description : quad 7a 1" beta bkg, cpm

Parameter Units : cpm Parameter Type : Generic

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 0.734474 Std Deviation : 0.058613

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
1-JAN-2007 19:21	BKG	0.7100		- <del></del>
3-JAN-2007 04:23	BKG	0.7700	ÌÌÌ	•
4-JAN-2007 02:28	BKG	0.7900		
5-JAN-2007 02:50	BKG	0.7400	ÌÌÌ	
6-JAN-2007 00:40	BKG	0.6800	ÌÌÌ	
6-JAN-2007 18:55	BKG	0.7200		
7-JAN-2007 19:08	BKG	0.7600		
9-JAN-2007 02:17	BKG	0.7300		
10-JAN-2007 02:15	BKG	0.7300		,
11-JAN-2007 02:30	BKG	0.7800		
12-JAN-2007 02:38	BKG	0.7900		
13-JAN-2007 00:11	BKG	0.9400	Ac	
13-JAN-2007 19:54	BKG	0.7800		
14-JAN-2007 21:02	BKG	0.7900		

0.7400

3-JAN-2007 04:23 BKG

monni pridintali da 1997 de 19		
4-JAN-2007 02:28 BKG	0.7100	111
5-JAN-2007 02:50 BKG	0.7900	iii
6-JAN-2007 00:40 BKG	0.6700	iii
6-JAN-2007 18:55 BKG	0.7200	iii
7-JAN-2007 19:08 BKG	0.7400	iii
9-JAN-2007 02:17 BKG	0.5600	In
10-JAN-2007 02:15 BKG	0.6800	ÌĖ
11-JAN-2007 02:30 BKG	0.7200	iii
12-JAN-2007 02:38 BKG	0.6600	iii
13-JAN-2007 00:11 BKG	0.7700	iii
13-JAN-2007 19:54 BKG	0.7600	ÌÌÌ
14-JAN-2007 21:02 BKG	0.6700	ÌÌÌ
16-JAN-2007 02:44 BKG	0.9300	Ac
17-JAN-2007 02:19 BKG	0.6700	
18-JAN-2007 03:03 BKG	0.7500	
19-JAN-2007 02:59 BKG	0.7000	
20-JAN-2007 02:35 BKG	0.8000	
20-JAN-2007 18:57 BKG	0.6700	
21-JAN-2007 19:43 BKG	0.6800	111
23-JAN-2007 02:22 BKG	0.7700	
24-JAN-2007 02:55 BKG	0.8100	+++
25-JAN-2007 02:40 BKG	0.7000	111
25-JAN-2007 23:56 BKG	0.7200	
26-JAN-2007 04:41	No Value	
27-JAN-2007 02:12 BKG	0.7900	
27-JAN-2007 20:03 BKG	0.7100	
28-JAN-2007 20:17 BKG	0.6800	
30-JAN-2007 01:37 BKG	0.7300	111
31-JAN-2007 03:32 BKG	0.7600	
1-FEB-2007 02:41 BKG	0.7000	
2-FEB-2007 02:36 BKG	0.6800	
3-FEB-2007 02:23 BKG	0.7100	
3-FEB-2007 20:15 BKG	0.8400	In
4-FEB-2007 13:19 BKG	0.8600	In
4-FEB-2007 20:07 BKG	0.7700	

# -- Multi-Test Full Report --

Description : quad 7c 1" bota bkg, cpm

Parameter Units : cpm Parameter Type : Generic

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 0.737188 Std Deviation : 0.120272

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
1-JAN-2007 19:21 3-JAN-2007 04:23	_	0.8700 0.8000		
4-JAN-2007 02:28	BKG	0.8000		
5-JAN-2007 02:50	_	0.8400		Daga + 2

Quality Assurance Multi-Test Full Report (continued) Page: 3

Quarty 1155 arance 1	viaiti i obt i ali	report (commect)		1 450 . 5
Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
6-JAN-2007 00:40	BKG	0.7900		- <b></b> -
6-JAN-2007 18:55	BKG	0.7000	iii	
7-JAN-2007 19:08	BKG	0.7300	iii	
9-JAN-2007 02:17	BKG	0.7900	iii	
10-JAN-2007 02:15	BKG	0.8400		
11-JAN-2007 02:30	BKG	0.7800	iii	
12-JAN-2007 02:38	BKG	0.8600	İİİ	
13-JAN-2007 00:11	BKG	1.0500	In	
13-JAN-2007 19:54	BKG	0.8100	111	
14-JAN-2007 21:02	BKG	0.7700		
16-JAN-2007 02:44	BKG	0.9100		
17-JAN-2007 02:19	BKG	0.8500		
18-JAN-2007 03:03	BKG	0.9400	$  \cdot  $	
19-JAN-2007 02:59	BKG	0.8100		
20-JAN-2007 02:35	BKG	0.8400		
20-JAN-2007 18:57	BKG	0.7700		
21-JAN-2007 19:43	BKG	0.7900		
23-JAN-2007 02:22	BKG	0.7600		
24-JAN-2007 02:55	BKG	0.8000		
25-JAN-2007 02:40	BKG	0.8100		
25-JAN-2007 23:56	BKG	0.8300		
26-JAN-2007 04:41		No Value		
27-JAN-2007 02:12		0.8900		
27-JAN-2007 20:03		0.7900		
28-JAN-2007 20:17		0.8600		
30-JAN-2007 01:37		0.7900		
31-JAN-2007 03:32		0.8300		
1-FEB-2007 02:41		0.8200		
2-FEB-2007 02:36	BKG/	0.7700		

3-FEB-2007 02:23 BKG	0.8900
3-FEB-2007 20:15 BKG	0.8900
4-FEB-2007 13:19 BKG	0.8800
4-FEB-2007 20:07 BKG	0.9000

# -- Multi-Test Full Report --

Description : quad 7d 1 beta bkg, cpm

Parameter Units : cpm Parameter Type : Generic

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 0.616895 Std Deviation : 0.086919

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
4 7 1 7 7 9 9 7 4 9 9 4				
1-JAN-2007 19:21	BKG	0.5500		
3-JAN-2007 04:23	BKG	0.6600		
4-JAN-2007 02:28	BKG	0.7000		
5-JAN-2007 02:50	BKG	0.4700		
6-JAN-2007 00:40	BKG	0.7300		
6-JAN-2007 18:55	BKG	0.4700		
7-JAN-2007 19:08	BKG	0.5200		
9-JAN-2007 02:17	BKG	0.4500		
Onality Agarmanas N	Ault: Tost Eull	Domant (continued)		Daga . 4

Quality Assurance Multi-Test Full Report (continued) Page: 4

		•		
Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
10-JAN-2007 02:15 11-JAN-2007 02:30 12-JAN-2007 02:38 13-JAN-2007 00:11 13-JAN-2007 19:54 14-JAN-2007 21:02 16-JAN-2007 02:44 17-JAN-2007 02:19	BKG BKG BKG BKG BKG BKG BKG	0.6400 0.7100 0.4500 0.6100 0.5400 0.5800 0.7400 0.4000	                                   In	
18-JAN-2007 03:03 19-JAN-2007 02:59 20-JAN-2007 02:35 20-JAN-2007 18:57 21-JAN-2007 19:43	BKG BKG BKG	0.4000 0.4500 0.6700 0.4600 0.4600	In                	

0.6400
0.4200  In
0.5100
0.5000
No Value
0.5200
0.4600
0.4300  In
0.4100  In
0.4100  In
0.3800  In
0.5400
0.7300
0.7400
0.7100
0.6900

Quality Assurance Report.

Generated 6-MAR-2007 11:02:35.36

Resubmitted

QA Filename

: \$DISK1:[QUAD5.QA]@HK.QAF;2

-- Multi-Test Full Report --

: quad 5a 1.5" beta %eff Description

Parameter Units: percent Parameter Type: Generic

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 46.680000 Upper Bound : 50.200001

Investigate Level: 2.000000 Action Level : 3.000000

---- Sample Driven N-Sigma Test Parameters ----

: 1-JUL-2005 00:00 End Date Start Date : 1-JAN-2006 00:00

Std Deviation: 0.586548 : 48.442482 Mean

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
15-DEC-2006 05:00	СНК	47.8000	)	<del></del>
16-DEC-2006 05:44	CHK	48.5000		
17-DEC-2006 07:54	CHK	48.3000		
18-DEC-2006 05:04	CHK	48.0000		
19-DEC-2006 04:50	CHK	48.1000		
20-DEC-2006 04:53	CHK	47.8000		
21-DEC-2006 05:38	CHK	48.5000		
22-DEC-2006 05:45	CHK	48.7000		
23-DEC-2006 08:04	CHK	48.2000		
26-DEC-2006 04:41	CHK	48.6000		
27-DEC-2006 04:47	CHK	49.2000		
28-DEC-2006 05:25	CHK	48.3000		
29-DEC-2006 05:20	CHK	48.7000		
30-DEC-2006 05:40	CHK	47.9000		
1-JAN-2007 11:48	CHK	48.4000		
2-JAN-2007 04:45	CHK	47.8000	ÌÌÌ	
3-JAN-2007 04:48	CHK	48.6000	iii	
4-JAN-2007 04:39	CHK	48.9000	ÌÌÌ	
5-JAN-2007 04:35	CHK	48.1000	İİİ	
6-JAN-2007 06:25	CHK	48.4000	ΪΪ	
8-JAN-2007 04:56	CHK	48.0000	iii	

26-JAN-2007 04:51 CHK	49.0000
27-JAN-2007 07:25 CHK	48.3000
29-JAN-2007 05:03 CHK	54.0000 Ab Ac
29-JAN-2007 05:22 CHK	48.1000
30-JAN-2007 05:02 CHK	47.9000
31-JAN-2007 05:08 CHK	48.9000
1-FEB-2007 04:55 CHK	47.5000
2-FEB-2007 04:59 CHK	49.1000
5-FEB-2007 05:11 CHK	49.2000
6-FEB-2007 05:03 CHK	48.3000
7-FEB-2007 05:00 CHK	48.3000
8-FEB-2007 04:52 CHK	48.9000
9-FEB-2007 04:55 CHK	47.6000
10-FEB-2007 07:34 CHK	48.7000
12-FEB-2007 05:07 CHK	48.9000
13-FEB-2007 04:56 CHK	48.7000
14-FEB-2007 04:39 CHK	48.0000

# -- Multi-Test Full Report --

Description : quad 5b 1.5" beta %eff

Parameter Units: percent Parameter Type: Generic ---- Lower/Upper Bounds Test Parameters ----

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 52.327450 Std Deviation : 0.553486

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
15-DEC-2006 05:00	•	52.0000		,
16-DEC-2006 05:44	CHK	52.1000		
17-DEC-2006 07:54	CHK	51.9000	111	
18-DEC-2006 05:04	CHK	51.8000		
19-DEC-2006 04:50	CHK	51.5000		
20-DEC-2006 04:53	CHK	51.9000		
21-DEC-2006 05:38	CHK	52.2000		
22-DEC-2006 05:45	CHK	51.8000	111	
23-DEC-2006 08:04	CHK	51.2000	In	
26-DEC-2006 04:41	CHK	51.8000		
27-DEC-2006 04:47	CHK	52.2000		
28-DEC-2006 05:25	CHK	50.9000	In	
29-DEC-2006 05:20	CHK	51.9000	111	
30-DEC-2006 05:40	CHK	51.1000	In	
1-JAN-2007 11:48	CHK	52.1000		
2-JAN-2007 04:45	CHK	52.2000	111	
3-JAN-2007 04:48	CHK	52.3000		
4-JAN-2007 04:39	CHK	51.8000	$\parallel \parallel \parallel$	
5-JAN-2007 04:35	CHK	52.6000		,
6-JAN-2007 06:25	CHK	51.6000		
8-JAN-2007 04:56	CHK	52.0000		
Quality Assurance M	Iulti-Test Full	Report (continued)		Page: 3

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
9-JAN-2007 04:49		52.2000		
10-JAN-2007 04:59	CHK	52.2000		
11-JAN-2007 04:59	CHK	51.4000	iii	
12-JAN-2007 04:47	CHK	52.2000	iii	
13-JAN-2007 05:59	CHK	51.9000	iii	
14-IAN-2007 09:50	CHK	52 6000	iii	

15-JAN-2007 04:53 CHK

13-3/114-2007 07.33 CITIX	32.4000
16-JAN-2007 04:50 CHK	52.0000
17-JAN-2007 04:50 CHK	52.4000
18-JAN-2007 04:47 CHK	51.6000
19-JAN-2007 04:49 CHK	51.3000
20-JAN-2007 06:56 CHK	52.2000
21-JAN-2007 07:12 CHK	51.3000
22-JAN-2007 05:04 CHK	51.4000
23-JAN-2007 04:59 CHK	52.3000
24-JAN-2007 04:46 CHK	51.8000
25-JAN-2007 04:51 CHK	52.9000
26-JAN-2007 04:51 CHK	51.6000
27-JAN-2007 07:25 CHK	51.5000
29-JAN-2007 05:03 CHK	57.6000 Ab Ac
29-JAN-2007 05:22 CHK	52.3000
30-JAN-2007 05:02 CHK	51.5000
31-JAN-2007 05:08 CHK	52.4000
1-FEB-2007 04:55 CHK	51.4000
2-FEB-2007 04:59 CHK	52.6000
5-FEB-2007 05:11 CHK	51.3000
6-FEB-2007 05:03 CHK	52.4000
7-FEB-2007 05:00 CHK	52.5000
8-FEB-2007 04:52 CHK	52.3000
9-FEB-2007 04:55 CHK	52.8000
10-FEB-2007 07:34 CHK	52.4000
12-FEB-2007 05:07 CHK	52.1000
13-FEB-2007 04:56 CHK	51.6000
14-FEB-2007 04:39 CHK	52.4000
Multi-Test Full Report	
Description : quad 5c 1.5") bet	a %eff
Parameter Units percent	Parameter Type : Generic
Lower/Upper Bounds Test	Parameters
Lower Bound : 49.700001	Upper Bound : 53.599998
Investigate Level: 2.000000	Action Level : 3.000000

52.4000 | | |

Mean : 51.695179 Std Deviation : 0.644022

: 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

---- Sample Driven N-Sigma Test Parameters ----

Start Date

Measurement Time			Value	LU SD UD BS Rej
15-DEC-2006 05:00				<del></del>
16-DEC-2006 05:44	CHK	51.4000 51.4000 51.5000	iii	
17-DEC-2006 07:54	CHK	51.5000		
18-DEC-2006 05:04	CHK	51.8000	iii	
Quality Assurance M				Page: 4
,		1 ( )		C
Measurement Time		Sample Analyst		LU SD UD BS Rej
19-DEC-2006 04:50 20-DEC-2006 04:53	CHK	50.8000		
20-DEC-2006 04:53	CHK	51.4000		
21-DEC-2006 05:38	CHK	51.1000		
22-DEC-2006 05:45	CHK	51.3000		
23-DEC-2006 08:04	CHK	51.5000		
26-DEC-2006 04:41	CHK	50.6000		
27-DEC-2006 04:47		50.9000		
28-DEC-2006 05:25		51.7000		
29-DEC-2006 05:20	CHK	50.7000		
30-DEC-2006 05:40	CHK	51.4000		
1-JAN-2007 11:48 (		51.9000		
2-JAN-2007 04:45 (		50.6000		
3-JAN-2007 04:48	CHK	51.3000		
4-JAN-2007 04:39		51.4000		
5-JAN-2007 04:35	CHK	50.8000		
6-JAN-2007 06:25	CHK	50.6000		
8-JAN-2007 04:56	CHK	52.3000		
9-JAN-2007 04:49	CHK	51.9000		
10-JAN-2007 04:59	CHK	51.0000		
11-JAN-2007 04:59	CHK	50.4000	In	
12-JAN-2007 04:47	CHK	50.8000		
13-JAN-2007 05:59	CHK	50.0000	In	
14-JAN-2007 09:50	CHK	50.2000	In	
15-JAN-2007 04:53	CHK	51.4000		
16-JAN-2007 04:50	CHK	51.5000		
17-JAN-2007 04:50	CHK	50.7000		
18-JAN-2007 04:47	CHK	50.2000	In	
19-JAN-2007 04:49	CHK	51.4000		
20-JAN-2007 06:56	CHK	51.6000		
21-JAN-2007 07:12	CHK	51.8000		
22-JAN-2007 05:04	CHK	50.8000		
23-JAN-2007 04:59	CHK	51.0000		
24-JAN-2007 04:46	CHK	50.7000		

25-JAN-2007 04:51 CHK	51.1000
26-JAN-2007 04:51 CHK	51.0000
27-JAN-2007 07:25 CHK	50.9000
29-JAN-2007 05:03 CHK	56.5000 Ab Ac
29-JAN-2007 05:22 CHK	50.7000
30-JAN-2007 05:02 CHK	50.8000
31-JAN-2007 05:08 CHK	50.8000
1-FEB-2007 04:55 CHK	50.3000  In
2-FEB-2007 04:59 CHK	51.6000
5-FEB-2007 05:11 CHK	51.6000
6-FEB-2007 05:03 CHK	50.3000  In
7-FEB-2007 05:00 CHK	49.6000 Be Ac
8-FEB-2007 04:52 CHK	50.7000
9-FEB-2007 04:55 CHK	50.9000
10-FEB-2007 07:34 CHK	51.7000
12-FEB-2007 05:07 CHK	51.8000
13-FEB-2007 04:56 CHK	51.7000
14-FEB-2007 04:39 CHK	50.9000
Multi-Test Full Report	
1	
Description : quad 5d 1.5" beta	%eff
- 1	arameter Type : Generic
	<b>J1</b>
Lower/Upper Bounds Test P	arameters
	Upper Bound : 52.259998
	-FF
Investigate Level: 2.000000	Action Level : 3.000000
Sample Driven N-Sigma Tes	st Parameters
Start Date : 1-JUL-2005 00:00	
Mean : 49.158169 Std	
. 13.130103 514	<b>Deviation</b> . 1.033330
Measurement Time Sample ID	Sample Analyst Value LU SD UD BS Rej
Quality Assurance Multi-Test Full 1	Report (continued) Page: 5
Quality / issurance ividiti Test I dil i	report (continued)
Measurement Time Sample ID	Sample Analyst Value LU SD UD BS Rej
15-DEC-2006 05:00 CHK	50.5000
16-DEC-2006 05:44 CHK	49.7000
17-DEC-2006 07:54 CHK	50.0000
	' ' '
18-DEC-2006 05:04 CHK	49.5000

file:///P /Transfer/qa1_gpc5_6-mar-2007-11023758.txt	
6-FEB-2007 05:03 CHK	49.5000
7-FEB-2007 05:00 CHK	49.0000
8-FEB-2007 04:52 CHK	50.2000
9-FEB-2007 04:55 CHK	49.1000
10-FEB-2007 07:34 CHK	49.4000
12-FEB-2007 05:07 CHK	48.4000
13-FEB-2007 04:56 CHK	49.4000
14-FEB-2007 04:39 CHK	49.0000

Quality Assurance Report. Generated 6-MAR-2007 11:02:36.53

QA Filename : \$DISK1:[QUAD5.QA]BKG 18.QAF;2

-- Multi-Test Full Report --

Description : quad 5a 1.5" beta bkg, cpm

Parameter Units : cpm Parameter Type : Generic

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 0.618656 Std Deviation : 0.062867

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
15-DEC-2006 02:30	BKG	0.6300	 	
16-DEC-2006 03:28	BKG	0.6500	iii	
16-DEC-2006 19:44	BKG	0.6400	iii	
17-DEC-2006 19:57	BKG	0.6300	iii	
19-DEC-2006 01:50	BKG .	0.6400	ÌÌÌ	
20-DEC-2006 03:22	BKG	0.5500		
21-DEC-2006 01:32	BKG	0.6200		
22-DEC-2006 04:23	BKG	0.5700		
23-DEC-2006 01:29	BKG	0.6200		
23-DEC-2006 20:36	BKG	0.5800		
24-DEC-2006 19:44	BKG	0.5900		
25-DEC-2006 20:26	BKG	0.6800		
27-DEC-2006 03:16		0.5600		
28-DEC-2006 01:39		0.6300		
29-DEC-2006 02:18	_	0.6500		
30-DEC-2006 02:54	BKG	0.6300		

30-DEC-2006 20:47 BKG	0.5400
31-DEC-2006 18:39 BKG	0.6500
1-JAN-2007 19:21 BKG	0.7700  In
3-JAN-2007 04:28 BKG	0.5900
4-JAN-2007 02:28 BKG	0.5900
5-JAN-2007 02:49 BKG	0.6700
6-JAN-2007 00:45 BKG	0.6400
6-JAN-2007 18:53 BKG	0.6400
7-JAN-2007 19:08 BKG	0.5800
9-JAN-2007 02:21 BKG	0.6400
10-JAN-2007 02:15 BKG	0.5800
11-JAN-2007 02:30 BKG	0.6600
12-JAN-2007 03:14 BKG	0.6100
13-JAN-2007 02:37 BKG	0.6700
13-JAN-2007 19:54 BKG	0.6200
14-JAN-2007 21:02 BKG	0.6300
16-JAN-2007 02:44 BKG	0.6800
17-JAN-2007 02:19 BKG	0.6600
18-JAN-2007 03:03 BKG	0.5700
19-JAN-2007 02:59 BKG	0.6700
20-JAN-2007 02:35 BKG	0.6200
20-JAN-2007 18:57 BKG	0.6200
21-JAN-2007 19:43 BKG	0.7000
23-JAN-2007 02:21 BKG	0.6300
24-JAN-2007 02:54 BKG	0.5700

Quality Assurance Multi-Test Full Report (continued)

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Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
25-JAN-2007 02:36	BKG	0.6100		
26-JAN-2007 02:13	BKG	0.6400		
27-JAN-2007 02:12	BKG	0.6200		
27-JAN-2007 20:03	BKG	0.6000		
28-JAN-2007 20:17	BKG	0.6700		
30-JAN-2007 01:36	BKG	0.6200		
31-JAN-2007 03:31	BKG	0.5500		
1-FEB-2007 02:35	BKG	0.6400		
2-FEB-2007 01:31	BKG	0.6900		•
3-FEB-2007 02:23	BKG	0.6600		
3-FEB-2007 21:25	BKG	0.6300		
4-FEB-2007 20:05	BKG	0.5400		
6-FEB-2007 02:57	BKG	0.6700		
7-FEB-2007 02:51	BKG	0.6700		

8-FEB-2007 01:20 BKG	0.6000
9-FEB-2007 03:19 BKG	0.6200
10-FEB-2007 01:33 BKG	0.6400
10-FEB-2007 20:18 BKG	0.6300
11-FEB-2007 20:02 BKG	0.5800
13-FEB-2007 03:15 BKG	0.5600
14-FEB-2007 03:00 BKG	0.6000

Description : quad 5b 1.5" beta bkg, cpm

Parameter Units : cpm Parameter Type : Generic

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 0.746882 Std Deviation : 0.115370

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
15-DEC-2006 02:30	BKG	0.8000	 	- <b></b>
16-DEC-2006 03:28	BKG	0.7600		
16-DEC-2006 19:44	BKG	0.7200		
17-DEC-2006 19:57	BKG	0.7000		
19-DEC-2006 01:50	BKG	0.7300		
20-DEC-2006 03:22	BKG	0.7300		
21-DEC-2006 01:32	BKG	0.7500		
22-DEC-2006 04:23	BKG	0.7200		
23-DEC-2006 01:29	BKG	0.7100		
23-DEC-2006 20:36	BKG	0.7100		
24-DEC-2006 19:44	BKG	0.7500		
25-DEC-2006 20:26	BKG	0.7200		
27-DEC-2006 03:16	BKG	0.8000		
28-DEC-2006 01:39	BKG	0.6900		
29-DEC-2006 02:18	BKG	0.7300		
30-DEC-2006 02:54	BKG	0.7100		
30-DEC-2006 20:47	BKG	0.6400		
31-DEC-2006 18:39	BKG	0.7900		
1-JAN-2007 19:21	BKG	0.7400		,
3-JAN-2007 04:28	BKG	0.6900		
Quality Assurance M	Iulti-Test Full	Report (continued)		Page: 3

Sample ID	Sample Analyst	Value	LU SD UD BS Re
BKG	. 0.7700	 	
BKG	0.6700	$  \cdot  $	•
BKG	0.7600		
BKG	0.7300		
BKG	0.7700		
BKG	0.6300	111	
BKG	0.7400		
BKG	0.6500		
BKG	1.0100	In	
BKG	0.7700		
BKG	0.7000		
BKG	0.7100		
BKG	0.7000		
BKG	0.7600		
BKG	0.7700	$  \cdot  $	
BKG	0.7100		
BKG	0.7800		
BKG	0.7700		
BKG	0.6500		
BKG	0.8100		
BKG	0.7600		
BKG	0.6400		
BKG	0.7900		
BKG	0.7600		
BKG	0.6900		
BKG	0.6800		
BKG	0.7100		
BKG	0.7200		
BKG	0.7500		
BKG	0.8100		
BKG	0.7400		
BKG	0.7300		
BKG	0.7800		
BKG	0.7800		
BKG	0.6900		
BKG	0.7900		
BKG	0.7100		
BKG	0.7800		
BKG	0.7600		
BKG	0.7700		
BKG	0.7700		
	BKG BKG BKG BKG BKG BKG BKG BKG BKG BKG	BKG 0.7700 BKG 0.7600 BKG 0.7300 BKG 0.7300 BKG 0.7700 BKG 0.6300 BKG 0.6500 BKG 0.7700 BKG 0.7700 BKG 0.7700 BKG 0.7000 BKG 0.7000 BKG 0.7000 BKG 0.7000 BKG 0.7000 BKG 0.7000 BKG 0.7000 BKG 0.7600 BKG 0.7700 BKG 0.7600 BKG 0.7700 BKG 0.7700 BKG 0.7700 BKG 0.7700 BKG 0.7700 BKG 0.7700 BKG 0.7500 BKG 0.6500 BKG 0.7600 BKG 0.7700 BKG 0.7800 BKG 0.7800 BKG 0.7800 BKG 0.7800 BKG 0.7800 BKG 0.7900 BKG 0.7900 BKG 0.7700	BKG

0.7800

0.7000

19-DEC-2006 01:50 BKG 0.5700 20-DEC-2006 03:22 BKG 0.6100 21-DEC-2006 01:32 BKG 0.6500 22-DEC-2006 04:23 BKG 0.6900 23-DEC-2006 01:29 BKG 0.6300 23-DEC-2006 20:36 BKG 0.6200 24-DEC-2006 19:44 BKG 0.7600 25-DEC-2006 20:26 BKG 0.7600 27-DEC-2006 03:16 BKG 0.7200 28-DEC-2006 01:39 BKG 0.6600 29-DEC-2006 02:18 BKG 0.6900 30-DEC-2006 02:54 BKG 0.6900 30-DEC-2006 20:47 BKG 0.6600 31-DEC-2006 18:39 BKG 0.6400 1-JAN-2007 19:21 BKG 0.6600 3-JAN-2007 04:28 BKG 0.6200 4-JAN-2007 02:28 BKG 0.7200 5-JAN-2007 02:49 BKG 0.7400

6-JAN-2007 00:45 BKG

6-JAN-2007 18:53 BKG

file:///P /Transfer/qa1_gpc5_	6-mar-2007-11023758.	txt		
7-JAN-2007 19:08	BKG	0.7000		
9-JAN-2007 02:21	BKG	0.6200	111	
10-JAN-2007 02:15	BKG	0.6400		
11-JAN-2007 02:30	BKG	0.6800	ÌÌÌ	
12-JAN-2007 03:14	BKG	0.8000	111	
13-JAN-2007 02:37	BKG	0.6900	111	
13-JAN-2007 19:54	BKG	0.7200	111	
14-JAN-2007 21:02	BKG	0.6000	111	
16-JAN-2007 02:44	BKG	0.6500		
17-JAN-2007 02:19	BKG	0.8100		
18-JAN-2007 03:03	BKG	0.6700		
19-JAN-2007 02:59	BKG	0.6900		
20-JAN-2007 02:35	BKG	0.8300		
20-JAN-2007 18:57	BKG	0.7000		
21-JAN-2007 19:43	BKG	0.6300		
23-JAN-2007 02:21	BKG	0.7100		
24-JAN-2007 02:54	BKG	0.6800		
25-JAN-2007 02:36	BKG	0.8300		
26-JAN-2007 02:13	BKG	0.7000		
27-JAN-2007 02:12	BKG	0.9500	Ac	
27-JAN-2007 20:03	BKG	0.7500		
28-JAN-2007 20:17	BKG	0.6900		
30-JAN-2007 01:36	BKG	0.6600		
31-JAN-2007 03:31	BKG /	0.7000		
1-FEB-2007 02:35	BKG /	0.7500		
2-FEB-2007 01:31	BKG	0.6400		
3-FEB-2007 02:23		0.6800		
3-FEB-2007 21:25	BKG	0.7600		
4-FEB-2007 20:05	BKG	0.7200		
6-FEB-2007 02:57	BKG	0.7400		
7-FEB-2007 02:51	BKG	0.6500		
Quality Assurance N	Multi-Test Full	Report (continued)		Page: 5
Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
8-FEB-2007 01:20	BKG	0.6900		
9-FEB-2007 03:19	BKG	0.7000		
10-FEB-2007 01:33	BKG	0.7400		
10-FEB-2007 20:18	BKG	0.7500		
11-FEB-2007 20:02	BKG	0.7300		
13-FEB-2007 03:15	BKG	0.6800		
14-FEB-2007 03:00	BKG	0.6400		
C)			v	

Description : quad 5d \(\)1.5" beta bkg, cpm

Parameter Units /cpm Parameter Type : Generic

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 0.587527 Std Deviation : 0.052312

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
15-DEC-2006 02:30	BKG	0.7100	In	
16-DEC-2006 03:28	BKG	0.6000	- Î I Î	
16-DEC-2006 19:44	BKG	0.6300	111	
17-DEC-2006 19:57	BKG	0.5500		
19-DEC-2006 01:50	BKG	0.6000		
20-DEC-2006 03:22	BKG	0.6700		
21-DEC-2006 01:32	BKG	0.6100		
22-DEC-2006 04:23	BKG	0.6400		
23-DEC-2006 01:29	BKG	0.7200	In	
23-DEC-2006 20:36	BKG	0.6200		
24-DEC-2006 19:44	BKG	0.5800		
25-DEC-2006 20:26	BKG	0.6700		
27-DEC-2006 03:16	BKG	0.6300		
28-DEC-2006 01:39	BKG	0.5700		
29-DEC-2006 02:18	BKG	0.5700		
30-DEC-2006 02:54	BKG	0.5900		
30-DEC-2006 20:47	BKG	0.6500		
31-DEC-2006 18:39	BKG	0.5700		
1-JAN-2007 19:21		0.5800		
3-JAN-2007 04:28	BKG	0.6400		
4-JAN-2007 02:28	BKG	0.6500		
5-JAN-2007 02:49	BKG	0.5900		
6-JAN-2007 00:45	BKG	0.6400		
6-JAN-2007 18:53	BKG	0.7000	In	
7-JAN-2007 19:08	BKG	0.5800		
9-JAN-2007 02:21	BKG	0.6100		
10-JAN-2007 02:15	BKG	0.6500		
11-JAN-2007 02:30	BKG	0.6500		
12-JAN-2007 03:14	BKG	0.5800		
13-JAN-2007 02:37	BKG	0.5900		

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
18-JAN-2007 03:03	BKG	0.6800		
19-JAN-2007 02:59	BKG	0.6200	iii	
20-JAN-2007 02:35	BKG	0.5900	iii	
20-JAN-2007 18:57	BKG	0.6600		
21-JAN-2007 19:43	BKG	0.6500		
23-JAN-2007 02:21	BKG	0.6800		
24-JAN-2007 02:54	BKG	0.6600		
25-JAN-2007 02:36	BKG	0.5800		
26-JAN-2007 02:13	BKG	0.6900		
27-JAN-2007 02:12	BKG	0.6800		
27-JAN-2007 20:03	BKG	0.6000		
28-JAN-2007 20:17	BKG	0.5800		
30-JAN-2007 01:36	BKG	0.6500		
31-JAN-2007 03:31	BKG	0.6800		
1-FEB-2007 02:35	BKG /	0.6200		
2-FEB-2007 01:31	BKG 🗸	0.5700		
3-FEB-2007 02:23	BKG	0.6200		
3-FEB-2007 21:25	BKG	0.6300		
4-FEB-2007 20:05	BKG	0.6100		
6-FEB-2007 02:57	BKG	0.7300	In	
7-FEB-2007 02:51	BKG	0.6200		
8-FEB-2007 01:20	BKG	0.6500		
9-FEB-2007 03:19	BKG	0.6600		
10-FEB-2007 01:33	BKG	0.5500		
10-FEB-2007 20:18	BKG	0.6300		
11-FEB-2007 20:02	BKG	0.6300		
13-FEB-2007 03:15	BKG	0.6300		
14-FEB-2007 03:00	BKG	0.6500		

Quality Assurance Report. Generated 6-FEB-2007 16:05:33.73

QA Filename : \$DISK1:[QUAD1.QA]CHK.QAF;2

-- Multi-Test Full Report --

Description : quad la 1 beta %eff

Parameter Units: percent Parameter Type: Generic

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 54.000000 Upper Bound : 57.799999

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 55.904877 Std Deviation : 0.629910

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 1-JAN-2007 11:52 CHK 55.2000 2-JAN-2007 04:50 CHK 55.3000 3-JAN-2007 04:48 CHK 55.1000 4-JAN-2007 04:39 CHK 54.7000 55.6000 5-JAN-2007 04:35 CHK 6-JAN-2007 06:30 CHK 55.8000 8-JAN-2007 05:01 CHK 56.0000 9-JAN-2007 04:54 CHK 55.1000 10-JAN-2007 04:59 CHK 55.2000 11-JAN-2007 04:59 CHK 55.1000 12-JAN-2007 04:47 CHK 54.2000 13-JAN-2007 06:04 CHK 55.0000 15-JAN-2007 04:58 CHK 55.4000 16-JAN-2007 04:55 CHK 56.0000 17-JAN-2007 04:50 CHK 55.4000 18-JAN-2007 04:52 CHK 55.1000 19-JAN-2007 04:49 CHK 55.9000 55.7000 20-JAN-2007 06:55 CHK 21-JAN-2007 07:11 CHK 57.1000 55.4000 22-JAN-2007 05:04 CHK 23-JAN-2007 04:59 CHK 55.3000

24-JAN-2007 04:46	CHK	55.6000	
25-JAN-2007 04:51	CHK	55.2000	
26-JAN-2007 04:51	CHK	55.3000	
27-JAN-2007 07:25	CHK	55.7000	
29-JAN-2007 05:03	CHK	55.7000	
30-JAN-2007 05:02	CHK	55.3000	
31-JAN-2007 05:08	CHK	55.6000	
1-FEB-2007 04:59	CHK	55.2000	
2-FEB-2007 05:04	CHK	54.5000	In
3-FEB-2007 07:35	CHK	56.0000	

Description : quad 1b 1') beta %eff

Parameter Units: percent Parameter Type: Generic

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 44.000000 Upper Bound : 51.000000

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 47.543636 Std Deviation : 1.162435

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

Quality Assurance Multi-Test Full Report (continued) Page: 2

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

1-JAN-2007 11:52 C	CHK	47.1000
2-JAN-2007 04:50 C	CHK	45.9000
3-JAN-2007 04:48 C	CHK	46.0000
4-JAN-2007 04:39 C	CHK	46.4000
5-JAN-2007 04:35 C	CHK	46.4000
6-JAN-2007 06:30 C	CHK	46.3000
8-JAN-2007 05:01 C	CHK	47.3000
9-JAN-2007 04:54 C	CHK	46.1000
10-JAN-2007 04:59 (	CHK	47.3000
11-JAN-2007 04:59 (	CHK	46.5000
12-JAN-2007 04:47 (	CHK	47.3000
13-JAN-2007 06:04 (	CHK	46.6000

15-JAN-2007 04:58 CHK	46.5000
16-JAN-2007 04:55 CHK	45.5000
17-JAN-2007 04:50 CHK	46.3000
18-JAN-2007 04:52 CHK	. 45.8000
19-JAN-2007 04:49 CHK	46.4000
20-JAN-2007 06:55 CHK	46.8000
21-JAN-2007 07:11 CHK	46.8000
22-JAN-2007 05:04 CHK	46.5000
23-JAN-2007 04:59 CHK	46.4000
24-JAN-2007 04:46 CHK	46.3000
25-JAN-2007 04:51 CHK	46.3000
26-JAN-2007 04:51 CHK	46.7000
27-JAN-2007 07:25 CHK	47.3000
29-JAN-2007 05:03 CHK	47.2000
30-JAN-2007 05:02 CHK	45.9000
31-JAN-2007 05:08 CHK	47.9000
1-FEB-2007 04:59 CHK	46.1000
2-FEB-2007 05:04 CHK	46.5000
3-FEB-2007 07:35 CHK	46.4000

Description : quad 1c 1" beta %eff

Parameter Units: percent / Parameter Type: Generic

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 49.000000 Upper Bound : 54.200001

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 51.623169 Std Deviation : 0.712431

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
1-JAN-2007 11:52	CHK	51.3000	 	<del></del>
2-JAN-2007 04:50	CHK	50.4000	iii	
3-JAN-2007 04:48	CHK	51.3000	i i i	
4-JAN-2007 04:39	CHK	50.6000	i i i i	
5-JAN-2007 04:35	CHK	51.7000	İİİ	
6-JAN-2007 06:30	CHK	50.9000		
8-JAN-2007 05:01	CHK	50.7000		

Quality Assurance Multi-Test Full Report (continued)

Page: 3

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
9-JAN-2007 04:54	СНК	51.2000		
10-JAN-2007 04:59	CHK	50.5000		
11-JAN-2007 04:59	CHK	50.3000	iii	
12-JAN-2007 04:47	CHK	50.1000	In	
13-JAN-2007 06:04	CHK	52.0000		
15-JAN-2007 04:58	CHK	51.2000	111	
16-JAN-2007 04:55	CHK	51.3000		
17-JAN-2007 04:50	CHK	50.8000		
18-JAN-2007 04:52	CHK	51.5000		
19-JAN-2007 04:49	CHK	49.9000	In	
20-JAN-2007 06:55	CHK	50.9000		
21-JAN-2007 07:11	CHK	50.5000		
22-JAN-2007 05:04	CHK	50.8000		
23-JAN-2007 04:59	CHK	50.2000		
24-JAN-2007 04:46	CHK	50.4000		
25-JAN-2007 04:51	CHK	49.8000	In	
26-JAN-2007 04:51	CHK	51.0000		
27-JAN-2007 07:25	CHK	50.7000		
29-JAN-2007 05:03	CHK	51.1000		
30-JAN-2007 05:02	CHK	50.9000		
31-JAN-2007 05:08	CHK	50.6000		
1-FEB-2007 04:59	CHK /	50.2000		
2-FEB-2007 05:04	CHK /	50.4000		
3-FEB-2007 07:35	CHK	52.6000		
Multi-Test Full Re	eport			
Description : qua	d 1d 1"/beta %	Seff		
Parameter Units : p	ercent P	arameter Type: Gene	eric	
Lower/Upper Lower Bound : 4	Bounds Test I 6.599998	Parameters Upper Bound : 50.	000000	
Investigate Level: 2	.000000	Action Level : 3.000	0000	
	UL-2005 00:00	st Parameters DEnd Date : 1-JA Deviation: 0.54406		00:00

Measurement Time	Sample ID	Sample Analyst		LU SD UD BS Rej
1-JAN-2007 11:52	CHK	48.2000		·
2-JAN-2007 04:50	CHK	47.8000		
3-JAN-2007 04:48	CHK	48.9000	ÌÌÌ	•
4-JAN-2007 04:39	CHK	48.6000	ÌÌÌ	
5-JAN-2007 04:35	CHK	48.0000		
6-JAN-2007 06:30	CHK	48.3000	i i i	
8-JAN-2007 05:01	CHK	47.1000	In	
9-JAN-2007 04:54	CHK	48.4000	111	
10-JAN-2007 04:59	CHK	48.0000		
11-JAN-2007 04:59	CHK	48.5000	ÌÌÌ	
12-JAN-2007 04:47	CHK	48.3000	111	
13-JAN-2007 06:04	CHK	47.3000	ÌÌÌ	
15-JAN-2007 04:58	CHK	48.6000	iii	
16-JAN-2007 04:55	CHK	47.5000	iii	
Quality Assurance N	Multi-Test Full	Report (continued)		Page: 4
Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
17-JAN-2007 04:50	CHK	48.0000		- <del></del>
18-JAN-2007 04:52	CHK	48.4000	iii	
19-JAN-2007 04:49	CHK	48.1000	i i i	
20-JAN-2007 06:55	CHK	47.9000	ÌÌÌ	
21-JAN-2007 07:11	CHK	47.6000	iii	
22-JAN-2007 05:04	CHK	48.1000	iii	
23-JAN-2007 04:59	CHK	48.5000	iii	
24-JAN-2007 04:46	CHK	47.7000	iii	
25-JAN-2007 04:51	CHK	48.6000	iii	
26-JAN-2007 04:51	CHK	48.0000	iii	
27-JAN-2007 07:25	CHK	48.4000	i i i	
29-JAN-2007 05:03	CHK	48.5000	iii	
30-JAN-2007 05:02	CHK	47.8000	iii	
31-JAN-2007 05:08	CHK	48.2000	iii	
1-FEB-2007 04:59	CHK/	47.6000		
2-FEB-2007 05:04	CHK	48.5000	iii	
3-FEB-2007 07:35	CHK	47.8000	İİİ	
Quality Assurance R	Report.	Generated 6-FEB-20	007 16:0	05:34.74
QA Filename : \$	DISK1:[QUA	D1.QA]BKG_I\QAF	;2	

Description : quad 1a 1" beta bkg, cpm

Parameter Units: cpm Parameter Type: Generic

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 0.617460 Std Deviation : 0.096733

Sample ID	Sample Analyst	Value	LU SD UD BS Rej
BKG	0.8000	<del></del>	
BKG	0.6700	iii	
BKG	0.5600	iii	
BKG	0.5900	iii	
BKG	0.6300	iii	
BKG	0.5900	iii	
BKG	0.6300	İİİ	
BKG	0.6200		
BKG	0.6600		
BKG	0.5800		
BKG	0.6100		
BKG	0.5900		
BKG	0.6000	+++	
BKG	0.6900		
BKG	0.6600		
BKG	0.6300		
BKG	0.6100		
BKG	0.6100		
BKG	0.6900		
BKG	0.9100	Ac	
BKG	0.6100		
BKG	0.6500		
BKG	0.6600		
BKG	0.6500		
BKG	0.6400		
BKG	0.7000		
BKG	0.7600		
BKG	0.7900		
BKG	0.6500		
BKG	1.3500	Ac	
	BKG BKG BKG BKG BKG BKG BKG BKG BKG BKG	BKG 0.8000 BKG 0.6700 BKG 0.5600 BKG 0.5900 BKG 0.6300 BKG 0.6300 BKG 0.6200 BKG 0.6600 BKG 0.5800 BKG 0.6100 BKG 0.6900 BKG 0.6000 BKG 0.6000 BKG 0.6000 BKG 0.6000 BKG 0.6000 BKG 0.6000 BKG 0.6000 BKG 0.6000 BKG 0.6500 BKG 0.6500 BKG 0.6500 BKG 0.6500 BKG 0.7900 BKG 0.7900 BKG 0.7900 BKG 0.7900 BKG 0.7900 BKG 0.7900 BKG 0.7900 BKG 0.7900 BKG 0.7900 BKG 0.7900 BKG 0.7900	BKG

0.6500

0.5800

-- Multi-Test Full Report --

14-JAN-2007 21:00 BKG

3-FEB-2007 21:25 BKG

4-FEB-2007 20:05 BKG

Description : quad 1b 1" beta bkg, cpm

Parameter Units: cpm Parameter Type: Generic

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 0.659153 Std Deviation : 0.179587

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

Quality Assurance Multi-Test Full Report (continued) Page: 2

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej 1-JAN-2007 19:25 BKG 0.6400 3-JAN-2007 04:27 BKG 0.77004-JAN-2007 02:27 BKG 0.6100 5-JAN-2007 02:49 BKG 0.6200 6-JAN-2007 00:45 BKG 0.8300 6-JAN-2007 18:51 BKG 0.6700 7-JAN-2007 19:07 BKG 0.6200 9-JAN-2007 02:20 BKG 0.6000 10-JAN-2007 02:15 BKG 0.6400 11-JAN-2007 02:30 BKG 0.5800 12-JAN-2007 02:37 BKG 0.6300 13-JAN-2007 02:36 BKG 0.7700 13-JAN-2007 19:53 BKG 0.6500

0.6400

file:///P /Transfer/qa1_gpc1_6-feb-2007-16053557.tr	xt		
21-JAN-2007 19:42 BKG	0.7000		
23-JAN-2007 02:20 BKG	0.6500	i i i	
24-JAN-2007 02:52 BKG	0.6200		
25-JAN-2007 02:36 BKG	0.6400	+	
26-JAN-2007 02:18 BKG	0.8300		
27-JAN-2007 02:10 BKG	0.7300		
27-JAN-2007 20:03 BKG	0.6600		
28-JAN-2007 20:16 BKG	0.6300		
30-JAN-2007 01:35 BKG	0.6300		
31-JAN-2007 03:28 BKG	0.7200		
1-FEB-2007 02:40 BKG 2-FEB-2007 02:33 BKG	0.7600		
3-FEB-2007 02:33 BKG	0.6700 0.6500	1 1 1	
3-FEB-2007 02:11 BKG 3-FEB-2007 21:25 BKG	0.6100	111	
4-FEB-2007 20:05 BKG	0.5900	1 1 1	
4-1 LD-2007 20.03 DKG	0.5900	1 1 1	
Multi-Test Full Report			
Description : quad 1c 1"/beta bl	• •		
Parameter Units : cpm Pa	rameter Type: Manı	ıal	
Investigate Level: 2.000000	Action Level : 3.000	0000	
Sample Driven N-Sigma Te	st Parameters		
Start Date : 1-JUL-2005 00:00		N-200	5.00:00
	Deviation: 0.11661		0 00.00
7 010 00 70 7 1010	Deviation . Ollioor		
Measurement Time Sample ID	Sample Analyst	Value	LU SD UD BS Rej
1-JAN-2007 19:25 BKG	0.5800		
3-JAN-2007 04:27 BKG	0.5300	iii	
4-JAN-2007 02:27 BKG	0.5500		
5-JAN-2007 02:49 BKG	0.5700		
6-JAN-2007 00:45 BKG	0.7000		
6-JAN-2007 18:51 BKG	0.5200		
Quality Assurance Multi-Test Full	Report (continued)		Page: 3
Measurement Time Sample ID	•	Value	LU SD UD BS Rej
7-JAN-2007 19:07 BKG	0.5100		
9-JAN-2007 02:20 BKG	0.5600		
10-JAN-2007 02:15 BKG	0.6200		
11-JAN-2007 02:30 BKG	0.5200	iii	

12-JAN-2007 02:37	BKG .	0.5100	
13-JAN-2007 02:36	BKG	1.0100	Ac
13-JAN-2007 19:53	BKG	0.5400	
14-JAN-2007 21:00	BKG	0.5000	
16-JAN-2007 02:42	BKG	0.6000	
17-JAN-2007 02:15	BKG	0.6300	
18-JAN-2007 02:53	BKG	0.6200	
19-JAN-2007 02:31	BKG	0.6700	İİİ
20-JAN-2007 02:22	BKG	0.5800	
20-JAN-2007 18:57	BKG	0.6500	İİİ
21-JAN-2007 19:42	BKG	0.6200	111
23-JAN-2007 02:20	BKG	0.5700	111
24-JAN-2007 02:52	BKG	0.5800	
25-JAN-2007 02:36	BKG	0.5500	
26-JAN-2007 02:18	BKG	0.6000	
27-JAN-2007 02:10	BKG	0.5500	
27-JAN-2007 20:03	BKG	0.5900	
28-JAN-2007 20:16	BKG	0.5500	
30-JAN-2007 01:35	BKG	0.5900	
31-JAN-2007 03:28	BKG	0.5900	
1-FEB-2007 02:40	BKG	0.6000	
2-FEB-2007 02:33	BKG/	0.6600	
3-FEB-2007 02:11	BKG	0.5300	
3-FEB-2007 21:25	BKG	0.5700	
4-FEB-2007 20:05	BKG	0.5500	
	i		

Description : quad 1d 1" bota bkg, cpm

Parameter Units : cpm Parameter Type : Manual

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUL-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 0.606455 Std Deviation : 0.089749

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
1-JAN-2007 19:25 3-JAN-2007 04:27 4-JAN-2007 02:27 5-JAN-2007 02:49	BKG BKG	0.6200 0.5900 0.6300 0.5800		

6-JAN-2007 00:45 BKG	0.7000
6-JAN-2007 18:51 BKG	0.5600
7-JAN-2007 19:07 BKG	0.5300
9-JAN-2007 02:20 BKG	0.5300
10-JAN-2007 02:15 BKG	0.6000
11-JAN-2007 02:30 BKG	0.5700
12-JAN-2007 02:37 BKG	0.5200
13-JAN-2007 02:36 BKG	0.8300  In

Quality Assurance Multi-Test Full Report (continued)

Page: 4

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
13-JAN-2007 19:53	BKG	0.6100		· <b></b>
14-JAN-2007 21:00	BKG	0.6100		
16-JAN-2007 02:42	BKG	0.6200		
17-JAN-2007 02:15	BKG	0.6700		
18-JAN-2007 02:53	BKG	0.7300		
19-JAN-2007 02:31	BKG	0.7200		
20-JAN-2007 02:22	BKG	0.5900		
20-JAN-2007 18:57	BKG	0.7500		
21-JAN-2007 19:42	BKG	0.6400		
23-JAN-2007 02:20	BKG	0.6400		
24-JAN-2007 02:52	BKG	0.5700		
25-JAN-2007 02:36	BKG	0.6100		
26-JAN-2007 02:18	BKG	0.6400	ÌÌÌ	
27-JAN-2007 02:10	BKG	0.6200	i i i	
27-JAN-2007 20:03	BKG	0.6600		
28-JAN-2007 20:16	BKG	0.5800	İİİ	
30-JAN-2007 01:35	BKG	0.5300	İİİ	
31-JAN-2007 03:28	BKG /	0.6100	iii	
1-FEB-2007 02:40	BKG/	0.6400		
2-FEB-2007 02:33	BKG	0.6000	ÌÌÌ	
3-FEB-2007 02:11	BKG	0.6500	i i i	
3-FEB-2007 21:25	BKG	0.6800	iii	
4-FEB-2007 20:05	BKG	0.5800	İİİ	

# RADIUM 226 SAMPLE AND QC DATA

STL RICHLAND 726

TRENT STL

Data Review/Verification Checklist RADIOCHEMISTRY, First Level Review

1/29/2007 11:14:17 AM

Lot No., Due Date:

J7A090287,J7A100115,J7A100118; 02/06/2007

Client, Site:

536403; AIR MONITORING Yerington Mine

QC Batch No., Method Test: 7011225; RRA2267 Ra-226 by ASC-7

SDG, Matrix:

33442,33443,33444; FILTER

	Is the ICOC page complete; includes all applicable analysis, dates, SOP numbers, and revisions?	Yeş	No	N/A
	QC Batch  Do the Summary/Detailed Reports include a calculated result for each sample listed on the QC Batch Sheet?	Yeş	No	N/A
2.2	Are the QC appropriate for the analysis included in the batch?	Yes	No	N/A
2.3	Is the Analytical Batch Worksheet complete; includes as appropriate, volumes, count times, etc?	Yes	No	N/A
2.4	Does the Worksheets include a Tracer Vial label for each sample?	Yes	No	N/A
	QC & Samples Is the blank results, yield, and MDA within contract limits?	Yeş	No	N/A
.2	Is the LCS result, yield, and MDA within contract limits?	Yes	No	N/A
.3	Are the MS/MSD results, yields, and MDA within contract limits?	Yes	No	N/A
.4	Are the duplicate result, yields, and MDAs within contract limits?	Yes	No	N/A
.5	Are the sample yields and MDAs within contract limits?	Yes	No	N/A
	Raw Data  Were results calculated in the correct units?	Yea	No	N/A
.2	Were analysis volumes entered correctly?	Yes	No	N/A
.3	Were Yields entered correctly?	Yes	No	N/A
.4	Were spectra reviewed/meet contractual requirements?	Yes	No	N/A
.5	Were raw counts reviewed for anomalies?	Yes	No	N/A
	Other Are all nonconformances included and noted?	Yes	No	N/J
.2	Are all required forms filled out?	Yes	No	N/A
.3	Was the correct methodology used?	Yes	No	N/A
.4	Was transcription checked?	Yes	No	N/A
.5	Were all calculations checked at a minimum frequency?	Yes	No	N/A
.6	Are worksheet entries complete and correct?	Yes	No	N/A
	Comments on any No response:			

First Level Review / / STL Richland

QAS\_RADCALCv4.8.26

Date 1/29/07

Page 1



#### Data Review Checklist RADIOCHEMISTRY Second Level Review

	HALLARE	
QC Batch Number:	7011225	

Review Item	Yes (√)	No (√)	N/A (1)
A. Sample Analysis			
1. Are the sample yields within acceptance criteria?			
2. Is the sample Minimum Detectable Activity < the Contract			
Detection Limit?	_/_		
3. Are the correct isotopes reported?			
B. QC Samples			
<ol> <li>Is the Minimum Detectable Activity for the blank result ≤ the</li> </ol>	ĺ	1	
Contract Detection Limit?			
2. Does the blank result meet the Contract criteria?	/		
3. Is the blank result < the Contract Detection Limit?			
4, Is the blank result > the Contract Detection Limit but the sample			
result < the Contract Detection Limit?			
5. Is the LCS recovery with contract acceptance criteria?			
7. Is the LCS Minimum Detectable Activity ≤ the Contract Detection			
Limit?			
8. Do the MS/MSD results and yields meet acceptance criteria?			
9. Do the duplicate sample results and yields meet acceptance			
criteria?			
C. Other			
1. Are all Nonconformances included and noted?			/
2. Are all required forms filled out?			
3. Was the correct methodology used?			
4. Was transcription checked?			
5. Were all calculations checked at a minimum frequency?	1 1		
6. Were units checked?			

Comments on any	140	response:	 	 	÷	
*			 	,		

Second Level Review Review Review Date: 1-29-07

1/16/2007 7:10:47 AM			Sample Preparation/Analysis	aration/Anal	/sis		Balance	Balance 1d:1120373922.1120403183	20403183
B 536403, Brown and Caldwell 다 Caldwell	, Brown &	BX Ra-226/ TE Ba-133 I	BX Ra-226/228 PrpRC5016, SepRC5005 TE Ba-133 bv Nal & Ra-226 bv Afoha Scint 7 dav ingrow	SepRC5005 ov Alpha Scint 7	dav ingrow		Pipet #:	##:	
		01 STAND	01 STANDARD TEST SET				Sep1 DT/Tm Te	Sep1 DT/fm Tech: * 1 1/1/07 4 .4 /	167 4:41
Batch: 7011225 FILTER FI SEQ Batch, Test: 7011229, BXTF	<b>pCi/sampl</b> All Tests: 7011219 9NS1, 7011221 BAS7, 7011225 BXTE, 7011229 BXTF,	NS1, 7011221 BA	<b>PM, Q</b> u 1S7, 7011225 BXTE	iote: SA, 6317	4		Sep2 DT/Tm Tech:	ch:	<del>.</del> !
							rrep le	rrep recn: woodi,narrisond	Cuo
Work Order, Lot, Total Amt Sample Date /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date	Comments:
1 JMK81-1-AC	531.15sa,g	150.19g,in	0.2355g 7, 4904 –	RATA25303 01/03/07	100	6.7	/h€/	0/6//	
		<b>\</b>	7.558	101			,	1/14/07	isos.
		, , , , , , , , , , , , , , , , , , ,	. 1166.			5 6 6 7 7 8 8 8 8 8 1 1 1 1 1 1 1 1 1 1 1 1 1	344	i	0,0011
12/05/2006 12:25	AmtRec	AmtRec: FILTER	#Containers: 1			Scr.	Alpha:		Beta:
2 JMLA1-1-AC 0.833sa,g	502.71sa,g	150.39g,in	0.2492g	RATA25304 01/03/07		<i>[]</i>	1461	,	
			14707		3	19/6/			
			1186	† ?		t	473 <i>9</i>	10/16/1	1053 4
12/05/2006 12:10	AmtRec	AmtRec: FILTER	#Containers: 1			Sor:	Alpha:	J	Beta:
3 JMLA4-1-AC 0.833sa,g	516.54sa,g	150.15g,in	0.2421g	RATA25305		(,)	2	/ - //	
J7A090287-3-SAMP			14807-	90		ò	1346	- 10/1/	0.50
		>	99/16	201			G5A		40011
12/05/2006 12:45	AmtRec	AmtRec: FiLTER	#Containers: 1			Sor:			Beta:
4 JMLA7-1-AC 0.833sa.g	519.32sa,g	150.24g,in	0.241g	RATA25306 01/03/07			101/11	1/2/	
			7.945 7.945			<i>y</i>	<b>)</b>		2051
			OHHO C				ASC '	0	21011
12/05/2006 12:30	AmtRe	AmtRec: FILTER	#Containers: 1		~	Ser:	Alpha:		Beta:
STL Richland Key: In - Initial A	Key: In - Initial Amt. fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2	Diluted Amt, s1 -	Sept, s2 - Sep2	Page 1	n - VSI	ISV - Insufficient Volume for Analysis	e for Analysis	V	WO Cnt: 4 Prep SamplePrep v4 8 26
	200,000								

1/16/2007 7:10:50 AM		00	Sample Preparation/Analysis	ration/Anal	sis		Balance	Balance Id:1120373922,1120373922,1120	120373922,1120
536403, Brown and Caldwell	, Brown &	BX Ra-226/2	BX Ra-226/228 PrpRC5016, SepRC5005	SepRC5005			Pinet #:		
		TE Ba-133 I	TE Ba-133 by Nal & Ra-226 by Alpha Scint 7 day ingrow	y Alpha Scint 7	day ingrow				
_		O1 STAND	01 STANDARD TEST SET				Sept D1/Im Tech:	ch:	
Batch: 7011225 FILTER	pCi/sampl		PM, Qu	PM, Quote: SA, 63174	4		Sep2 DT/Tm Tech:	ch:	
							Prep Tec	Prep Tech: WoodT,HarrisonJ	ruos
Work Order, Lot, Total Amt Sample Date // Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)		Count Time Min	Detector Id	Count On Off (24hr) Circle	CR Analyst, Init/Date	Comments:
5 JMLA8-1-AC 0.833sa,g	500.78sa,g	150.69g,in	0.2507g 7/ // 22.7	RATA25307 01/03/07	ooi Oo	¥)	7,5	a/c//	
			1,702		1 /.		r9///	1 (	\
			1.0984	5	, ,	SWL	T -		
12/05/2006 12:50	AmtRec	AmtRec: FILTER	#Containers: 1			Sor	Aipha:	)	Beta:
6 JMLT2-1-AC 0.833sa,g J7A100115-1-SAMP	524.49sa,g	150.01g,in	0.2382g 7 4 VSg	RATA25308 01/03/07		44	$\mathcal{A}_{\mathcal{E}_i}$	012/07 01/1	
			7,240	\			1/10/07	5051	
			1,03335			X	KME 1/24/07		
12/11/2006 11:40	AmtRec	AmtRec: FILTER	#Containers: 1			Sor:	Alpha:		Beta:
7 JMLT6-1-AC 0.833sa,g J7A100115-2-SAMP	532.31sa,g	150.08g,in	0.2349g	RATA25309 01/03/07		67	1320	Ox0 2 0/21/1	
			4/1/				1/19/07	7 1530	
			1,0556				FMA 1/24/07		
12/11/2006 12:00	AmtRec	AmtRec: FILTER	#Containers; 1			Scr.	Alpha:		Beta:
8 JMLT7-1-AC 0.833sa,g J7A100115-3-SAMP	527.80sa,g	150.17g,in	0.237g 7, 5,286_	RATA25310 01/03/07		96	1320	Q1 L0/21/1	
			7,686				1/idlo7	si of Fee	Los
			9795			7	COTESTI SHU	d 1211	
12/11/2006 12:15	AmtRec	AmtRec: FILTER	#Containers: 1		⇒	Scr:	Alpha;		Beta:
STL Richland Key: In - Initial Amt, Richland Wa. pd - Prep Dt. r -	In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2 pd - Prep Dt, r - Reference Dt, ec-Enrichment Cell, ct-Cocktailed Added	Diluted Amt, s1 -	Sep1, s2 - Sep2 t-Cocktailed Added	Page 2	ISV - Ins	ISV - Insufficient Volume for Analysis	e for Analysis	V Prep_	WO Cnt: 8 Prep_SamplePrep v4.8.26

1/16/2007 7:10:51 AM			Sample Preparation/Analysis	aration/Ana!	Vsis		Ralan	Balance	73022 1120
536403, Brown and Caldwell	Brown &	BX Ra-226/	BX Ra-226/228 PrpRC5016, SepRC5005	SepRC5005			i d	Pipet #:	
Caldwell		TE Ba-133	TE Ba-133 by Nal & Ra-226 by Alpha Scint 7 day ingrow	oy Alpha Scint 7	day ingrow		Sent OT/Im Tech:	Toch.	
AnalyDueDate: 02/05/2007			ARD IEST SET				sept Divini		
Batch: 7011225 FILTER SEO Batch Test: 7011229, BXTF	pCi/sampl	-	PM, Q	PM, Quote: SA, 63174	74		Sep2 DT/Tm Tech:	rech:	
							Prep	Prep Tech: WoodT,HarrisonJ	_
Work Order, Lot, Total Amt Sample Date /Unit	Total Acidified/Unit	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count Time Min	Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
<b>9 JMLT8-1-AC</b> 0.833sa,g J7A100115-4-SAMP	503.04sa,g	150.10g,in	7.5572	01/03/07	ا 0دي	85	1351	020 10/11/1	9
	1		6,363					1/14/07 H305	A
			1,1867				12H		d
12/11/2006 11:45	AmtRe	AmtRec: FILTER	#Containers: 1			Scr:	Alpha:	Beta:	a:
10 JMLVA-1-AC 0.833g J7A100115-5-SAMP	511.47g	150.26g,in	0.2447g 7,5190 _	RATA25312 01/03/07		62	1281	042 60/11/1	9
			8,383	\	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			1/19/07 1508	215
			.8969				226	+9111 CO/FIC/1	8
12/11/2006 12:20	AmtRe	AmtRec: FILTER	#Containers: 1			Scr:	Alpha:	Beta:	;a;
11 JMLVW-1-AC 0.833g J7A100118-1-SAMP	502.79g	150.23g,in	0.2489g 7, 4904	RATA25313 01/03/07		<i>"</i> 6	132(	1/11/11000	
			8.3834	J.				chorsi Lalbi/I	d
			7, 97				40ħ	JP411 10/42/1	2
12/13/2006 12:10	AmtRe	AmtRec: FILTER	4398 / #Containers: 1			Scr	Alpha:	Beta:	ia:
<b>12 JMLV3-1-AC</b> 0.833sa,g J7A100118-2-SAMP	507.51sa,g	150.25g,in	0.2466g 7.5095	RATA25314 01/03/07		6.1	55.5%	<1/11/2>	
			7,57	,		,	)	1961 1520	
			- 9920 -	\			820		
12/13/2006 12:43	AmtRe	AmtRec: FILTER	#Containers: 1		$\Rightarrow$	Scr	pha:		ja:
STL Richland Key: In - Initial Amt, Bichland Wa Dd - Preo Dt. r -		fi - Final Amt, di - Diluted Amt, s1 - Sep1, Reference Dt. ec-Enrichment Cell. ct-Cock	- Sep1, s2 - Sep2 ct-Cocktailed Added	Page 3	ISV - In	ISV - Insufficient Volume for Analysis	ne for Analysis	WO Prep_Sam	WO Cnt: 12 Prep_SamplePrep v4.8.26

STL RICHLAND

Acidifi 510.8	sampl	BX Ra-226/228 PrpRC5016, SepRC5005 TE Ba-133 by Nal & Ra-226 by Alpha Scint 7 day ingrow 01 STANDARD TEST SET PM, Quote: SA, 63174	rpRC5016, SepRC5005 il & Ra-226 by Alpha Scint 7 day i TEST SET	day ingrow		Pipe	Pipet #:	
eDate: 02/05/2007 011225 FILTER  n, Test. 7011229, BXTF  er, Lot, Total Amt Total Acidifi  -AC 0.833sa,g 510.8	sampl	by Nai & Ra-226 b JARD TEST SET PM, Qu	y Alpha Scint 7	day ingrow		Adir Tariffe Anno	# 15	
Acidifi 510.8	sampl	JARD TEST SET PM, Qu				TATILITY TY		
Acidiff	samp	PM, Qu				sepi DI/IM lecn:	ech:	
			PM, Quote: SA, 63174	74		Sep2 DT/Tm Tech:	ech:	
Total Amt /Unit 0.833sa.g	# # # # # # # # # # # # # # # # # # #					Prep Te	Prep Tech: WoodT,HarrisonJ	Puos
0.833sa.g		Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date		Detector Id	Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
		0.2448g	RATA25315 01/03/07	୍ଚତା	>9	1387	2011/1	\ \frac{1}{2}
		7,046					ex 19/61/1	A STATE
		/h/PO"				LMC		71151
12/13/2006 13:15	AmtRec: FILTER	#Containers: 1			Scr	Alpha:		Beta:
14 JMLV8-1-AC 0.833sa,g 504.92sa,g J7A100118-4-SAMP	150.22g,in	0.24789	RATA25316 01/03/07		<i>h</i> 5)	1257	cΩ' C/'	Casa
		6,775				, , , , , , , , , , , , , , , , , , ,	19/67	Son
		1.1098				qeA	1 5	3044
12/13/2006 13:18	AmtRec: FILTER	#Containers: 1			Scr.	Alpha:		Beta:
15.JMLV9-1-AC 0.833sa.g 511.81sa.g J7A100118-5-SAMP	150.27g,in	0.2446g 7,5286	RATA25317 01/03/07		رع	(35)	<ul><li>0/1/1</li></ul>	V0551
		7,465	\				_	18561
		1.0085				NMA	1/24/67 130	1309,0
12/13/2006 13:21	AmtRec: FILTER	#Containers: 1			Scr.	Alpha:		Beta:
16 JMN85-1-AA-B J7A110000-229/BLK	152.17g,in	152.17g 7,7,4522	RATA25318 01/03/07		99	(2)	1/17/62	
		6,913	,			7001	1/19/01/1	15504
-		1,0780 J				MRA	( ;	1219 0
12/05/2006 12:25	AmtRec: #C	#Containers: 1		$\Rightarrow$	Scr.	Alpha:		Beta:
Key:	fi - Final Amt, di - Diluted Amt, s1 - Sep1	ı	Page 4	ISV - Ins	ISV - Insufficient Volume for Analysis	e for Analysis	N : 3	WO Cnt: 16
Richland Wa. pd · Prep Dt, r · Reference Dt, ec-Enrichment Cell, ct-Cocktalled Added	Ot, ec-Enrichment Cell, (	ct-Cocktailed Added					Prep	Prep_SamplePrep v4.8.26

H AnalyDueDate: 02/05/2007 H Batch: 7011225 F SEQ Batch, Test: None		V D. 126/130	BX Ra-226/228 PrpRC5016, SepRC5005	/228 ProRC5016, SepRC5005			Pipet #:	, ;	
		37 HB-220/22		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
-		TE Ba-133 by Naf & Ra-22( 01 STANDARD TEST SET	Nai & Ra-226 b O TEST SET	TE Ba-133 by Naf & Ra-226 by Alpha Scint 7 day ingrow 01 STANDARD TEST SET	7 day ingrow		Sep1 DT/Tm Tech:	ich:	
	pCi/sampl						Sep2 DT/Tm Tech:	ch:	
							Prep Te	Prep Tech: ,HarrisonJ	
Work Order, Lot, Total Amt	Total   Initi	Initial Aliquot Amt/Unit	Adj Aliq Amt (Un-Acidified)	QC Tracer Prep Date	Count De Time Min		Count On   Off (24hr) Circle	CR Analyst, Init/Date	Comments:
17 JMN85-1-AC-C J7A110000-225/LCS	150	150.10g,in 150	150.109	RASC4320 11/22/06	001	35)	1357	4/4/	sna/U
		7	7335				, ,		15500
		,	· 488h V		9	SMB &	QMB QMB 1/24/07	oz 1320 p	d
12/05/2006 12:25	AmtRec:	#Containers: 1	ners: 1			Scr:	Alpha:		Beta:
All Clients for Batch: 536403, Brown and Caldwell		Brown &	caldwell	•	SA , 63174				
UMK811AC-SAMP Constituent List: Ba-133 RDL: pC	; pci/sam LCL:20	UCL:115	RPD:20	Ra-226	RDL:1.00E+00	pCi/sam	m LCL:	UCL:	RPD:
JMN851AA-BLK: Ba-133 RDL: pC	pci/sam rcr:20	UCL:115	RPD:20	Ra-226	RDL:1.00E+00	pci/sam	m LCL:	UCL:	RPD:
JMNN851AC-LCS: Ba-133 RDL: pC	pci/sam LCL:20	UCL:115	RPD:20	Ra-226	RDL:1	pCi/sam	m LCL:70	UCL:130	RPD:20
TMK811AC-SAMP Calc Info:	V - TO CADE	BIR Subt	N Sci Not	<b>&gt;</b>	ODRa: B				
		a dig	; 2	· >	, pr				
7 :: (8#)	Decay to sabt:	TOTAL STREET							
Uncert Level (#s).: 2 I	Decay to Sabt: Y	Bik subt.:	z	Sci.Not.: Y ODKs: Approved By	obks: B			Date:	
STL Richland Key: In - Initial Amt,	In - Initial Amt, fi - Final Amt, di - Diluted Amt, s1 - Sep1, s2 - Sep2	ited Amt, s1 - Se		Page 5	ISV - Insuffic	ISV - Insufficient Volume for Analysis	for Analysis	Pre	WO Cnt: 17 Prep SamplePrep v4 8.26

1/29/2007 11:13:44 AM

# ICOC Fraction Transfer/Status Report ByDate: 1/29/2006, 2/3/2007, Batch: 7011225', User: \*ALL Order By DateTimeAccepting

Batch Work	Ord CurStat	tus Ad	ccepting		Comments
011225					
IC	CalcC	WoodT	1/15/2007 12:3	1:12	
SC		wagarr	IsBatched	1/11/2007 11:25:28 AM	ICOC_RADCALC v4.8.26
C		WoodT	Prep1C	1/15/2007 12:31:12 PM	RICH-RC-5016 REVISION 5
C		HarrisonJ	InPrep	1/16/2007 6:49:39 AM	RICH-RC-5005 Revision 5
C		LongA	Sep1C	1/17/2007 9:56:55 AM	RICH-RC-5005 REVISION 5
С		BlackCL	InCnt1	1/17/2007 10:47:29 AM	RICH-RD-0007 REVISION 5
C ·		DAWKINSO	Cnt1C	1/17/2007 2:39:44 PM	RICH-RD-0007 REVISION 5
C		PetersonJ	InSep2	1/19/2007 4:09:31 PM	RICH-RC-5005 REVISION 5
C		PetersonJ	CalcC	1/25/2007 7:52:36 AM	RICH-RC-5005 REVISION 5
0		HarrisonJ	1/16/2007 6:49	:39	
С		Long <b>A</b>	1/17/2007 9:56	:55	
C		BlackCL	1/17/2007 10:4	7:29	
C		DAWKINSO	1/17/2007 2:39	:44 PM	
IC		PetersonJ	1/19/2007 4:09	:31 PM	
AC .		PetersonJ	1/25/2007 7:52	:36	

AC: Accepting Entry; SC: Status Change

STL Richland Richland Wa.

1/29/2007 11	:13:43 AM		Rpt DB Trans	ster log (	Batch	า Res	ults)			
SDG or Batch	Rpt Db Id		LotSample Client Id	Matrix	Recei	ved Date	Sample			·
<u>Isotope</u> 3442	Method 9JMK81		Oc Analysis Date Result J7A0902871 P-0812	Cnt Uncert		<u>моа</u> 07 10:00:00	<u>Units</u> 12/5/20	<u> </u>	.vo	lumes
ALPHA	BAS7	0	1/23/2007 7;52:27 PM 7.3565E	+00 1.942E+00	2.126E+00	5.371E+00	PCI/SA	1.0	1.0E+0	1.971E-
RA-226	BXTE	0	1/24/2007 2:00:00 PM -1.8572		2.11E-01	8.045E-01		1,009	1.0E+0	2.355E-
TH-228	9NS1	ō	1/17/2007 10:03:53 PM3.9481E				PCI/SA	0.953	1.0E+0	7.881E-
TH-230	9NS1	Ō	1/17/2007 10:03:53 PM3.0258E			2.269E-01		0.953	1.0E+0	7.881E-
TH-232	9NS1	Ō	1/17/2007 10:03:53 PM-3,7821			2.784E-01	•	0.953	1.0E+0	7.881E-
3442	9JMLA1		J7A0902872 P-0813	FILTE	R 1/8/20	07 10:00:00	12/5/20	006 12:10:00 PM		
ALPHA	BAS7	0	1/23/2007 7:52:27 PM 5.0205E	+00 1.488E+00	1.593E+00	3.811E+00	PCI/SA	1.0	1.0E+0	2.076E-
RA-226	BXTE	0	1/24/2007 1:53:00 PM 2.6875E		2.152E-01	7.447E-01	PCI/SA	1.013	1.0E+0	2.492E-
TH-228	9NS1	0	1/17/2007 10:04:06 PM7.7868E		1.829E-01	8,388E-01	PCI/SA	0.438	1.0E+0	8.298E-
TH-230	9NS1	0	1/17/2007 10:04:06 PM2,2391E	-01 1.346E-01	1.362E-01	4.477E-01	PCI/SA	0.438	1.0E+0	8.298E-
TH-232	9NS1	0	1/17/2007 10:04:06 PM0.0E+00	0.0E+00	8.345E-02	4.477E-01	PCI/SA	0.438	1.0E+0	8.298E-
3442	9JMLA4	10	J7A0902873 P-0814	FILTE	R 1/8/20	07 10:00:00	12/5/2	006 12:45:00 PM		
ALPHA	BAS7	0	1/23/2007 7:52:27 PM 1.021E+	01 2.124E+00	2.428E+00	5.17E+00	PCI/SA	1.0	1.0E+0	2.024E-
RA-226	BXTE	0	1/24/2007 2:00:00 PM -2.0119I	-01 1.475E-01	1.489E-01	6.547E-01	PCI/\$A	1.056	1.0E+0	2.421E-
TH-228	9NS1	0	1/17/2007 10:04:25 PM1.8576E	-01 1.273E-01	1.283E-01	4.461E-01	PCI/SA	0.833	1.0E+0	8.115E-
TH-230	9NS1	0	1/17/2007 10:04:25 PM1.271E-	9.165E-02	9.234E-02	3.05E-01	PCI/SA	0.833	1.0E+0	8.115E-
TH-232	9NS1	0	1/17/2007 10:04:25 PM-2.5423I	-02 5.684E-02	5.689E-02	3.05E-01	PCI/SA	0.833	1.0E+0	8.115E-
33442	9JMLA7	10	J7A0902874 P-0815	FILTE	R 1/8/20	00:00:00	12/5/2	006 12:30:00 PM		
ALPHA	BAS7	0	1/23/2007 7:52:27 PM 8.5202E	+00 1.921E+00	2.163E+00	4.521E+00	PCI/SA	1.0	1.0E+0	2.008E-
RA-226	BXTE	0	1/24/2007 2:01:01 PM 4.2187E	<b>-01</b> 1.722E-01	1.783E-01	5.027E-01	PCI/SA	1.059	1.0E+0	2.41E-1
TH-228	9NS1	0	1/17/2007 10:04:10 PM1.636E-	01 8.016E-02	8.133E-02	2.01E-01	PCI/SA	0.996	1.0E+0	8.039E-
TH-230	9NS1	0	1/17/2007 10:04:10 PM9.5387E	-02 5.94E-02	5.994E-02	1.632E-01	PCI/SA	0.996	1.0E+0	8.039E-
TH-232	9NS1	0	1/17/2007 10:04:10 PM2.044E-	02 3.54E-02	3.544E-02	1.925E-01	PCI/SA	0.996	1.0E+0	8.039E-
33442	9JMLA8	10	J7A0902875 000580	FILTE	R 1/8/20	00:00:00	12/5/2	006 12:50:00 PM		
ALPHA	BAS7	0	1/23/2007 7:52:27 PM 1.2459E	+01 2.199E+00	2.634E+00	4.493E+00	PCI/SA	1.0	1.0E+0	2.094E-
RA-226	BXTE	0	1/24/2007 2:24:00 PM 5.1999E		1.49E-01	3.12E-01	PCI/SA	0.91	1.0E+0	2.507E-
TH-228	9NS1	0	1/17/2007 10:04:38 PM1.1513E	-01 7.339E-02	7.403E-02	2.472E-01	PCI/SA	0.893	1.0E+0	8.345E-
TH-230	9NS1	0	1/17/2007 10:04:38 PM3.6534E	-01 1.147E-01	1.188E-01	1.948E-01	PCI/SA	0.893	1.0E+0	8.345E-
TH-232	9NS1	0	1/17/2007 10:04:38 PM2.757E-	02 3.515E-02	3.523E-02	1.651E-01	PCI/SA	0.893	1.0E+0	8.345E-
33443	9JMLT2	10	J7A1001151 P-0816	FILTE	ER 1/8/20	007 10:00:00	12/11/	2006 11:40:00 AM		
ALPHA	BAS7	0	1/24/2007 11:27:16 2.4671E	+01 3.073E+00	4.223E+00	4.533E+00	PCI/SA	1.0	1.0E+0	1.987E-
RA-226	BXTE	0	1/24/2007 2:16:00 PM 1.7788E	-02 1.722E-01	1.722E-01	6.813E-01	PCI/SA	0.968	1.0E+0	2.382E-
TH-228	9NS1	0	1/17/2007 10:04:53 PM6.9525E	-02 8.978E-02	8.998E-02	3.897E-01	PCI/SA	1.034	1.0E+0	7.981E-
TH-230	9NS1	0	1/17/2007 10:04:53 PM1.7867E	-01 9.209E-02	9.337E-02	2.679E-01	PCI/SA	1.034	1.0E+0	7.981E-
TH-232	9NS1	0	1/17/2007 10:04:53 PM4.4668E	-02 4.994E-02	5.009E-02	2.679E-01	PCI/SA	1.034	1.0E+0	7.981E-
33443	9JMLT6	10	J7A1001152 P-0817	FILTE	R 1/8/2	007 10:00:00	12/11/	2006 12:00:00 PM		
ALPHA	BAS7	0	1/24/2007 11:27:16 1.7047E	+01 2.595E+00	3.236E+00	4.148E+00	PCI/SA	1.0	1.0E+0	1.972E-
RA-226	BXTE	Ó	1/24/2007 2:21:00 PM 1.9821E	-01 1.103E-01	1.122E-01	3.539E-01	PCI/SA	0.947	1.0E+0	2.349E-
TH-228	9NS1	0	1/17/2007 10:05:00 PM3.2653E	-01 1.361E-01	1.391E-01	3.264E-01	PCI/SA	0.925	1.0E+0	7.84E-2
TH-230	9NS1	0	1/17/2007 10:05:00 PM3.1463E	-01 1.311E-01	1.34E-01	3.145E-01	PCI/SA	0.925	1.0E+0	7.84E-2
TH-232	9NS1	0	1/17/2007 10:05:00 PM0.0E+00	0.0E+00	5.863E-02	3.145E-01	PCI/SA	0.925	1.0E+0	7.84E-2
33443	9JMLT7	10	J7A1001153 P-0818	FILTE	ER 1/8/2	00:00:00	12/11/	/2006 12:15:00 PM		
ALPHA	BAS7	0	1/24/2007 11:27:16 2.0458E	+01 2.807E+00	3.665E+00	4.808E+00	PCI/SA	1.0	1.0E+0	1.987E-
RA-226	BXTE	0	1/24/2007 2:21:00 PM 1.2927E	+00 3.086E-01	3.34E-01	9.176E-01	PCI/SA	1.021	1.0E+0	2.37E-1
TH-228	9NS1	0	1/17/2007 10:06:45 PM1.0138E			3.408E-01		1.003	1.0E+0	7.935E-
TH-230	9NS1	0	1/17/2007 10:06:45 PM1.9537E	-02 4.368E-02	4.372E-02	2.344E-01	PCI/SA	1.003	1.0E+0	7.935E
TH-232	9NS1	0	1/17/2007 10:06:45 PM-1.9536					1.003	1.0E+0	7.935E
33443	9JMLT8	10	J7A1001154 P-0819					/2006 11:45:00 AM		
ALPHA	BAS7	0	1/24/2007 11:27:16 1.02198	+00 9.422E-01	9.498E-01	3.921E+00	PCI/SA	1.0	1.0E+0	2.078E-
RA-226	BXTE	0	1/24/2007 2:56:00 PM 5.1854E					0.843	1.0E+0	2.486E-
								_		

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<sup>7011225, \*\*</sup>Samples Inserted | Updated | NotUpdated => 2 | 0 | 15,

\*\*Results Inserted | ReTestInserted | Updated | NotInserted => 17 | 0 | 0 | 0.

\*\*Diff RptDb | Qtims => .

SDG or Batch	Rpt Db Id		LotSample	Client Id	Matrix	c Recei	ved Date	Sami	ole Date		
	Method		Oc Analysis Date	Result		Tot uncer	MO8	Units	<u> ⊨xpected</u> Yield		lumes
TH-230	9NS1	0	1/17/2007 10:06:4					PCI/SA	0.746	1.0E+0	8.314E-2
TH-232	9NS1	0	1/17/2007 10:06:4				2.912E-01		0.746	1.0E+0	8.314E-2
33444	9JMLV3		J7A1001182	P-0821	FILTE		07 10:00:00		3/2006 12:43:00 PM		
ALPHA	BAS7	0	1/24/2007 2:12:29		1.697E+00		3.988E+00		1.0	1.0E+0	2.057E-2
RA-226	BXTE	0	1/24/2007 2:54:00				4.799E-01		1.008	1.0E+0	2.466E-1
TH-228	9NS1	0	1/17/2007 10:06:4		9.95E-02		2.605E-01		0.883	1.0E+0	B.297E-2
TH-230	9NS1	0.	1/17/2007 10:06:4				2.515E-01	PCI/SA	0.883	1.0E+0	9.297E-2
TH-232	9NS1	0	1/17/2007 10:06:4				2.515E-01		0.883	1.0E+0	B.297E-2
33444	9JMLV5		J7A1001183	P-0822	FILTE		07 10:00:00		3/2006 1:15:00 PM		
ALPHA	BAS7	0	1/24/2007 2:12:29				4.653E+00		1.0	1.0E+0	2.053 <b>E</b> -2
RA-226	BXTE	.0	1/24/2007 4:11:00		1.635E-01	1.638E-01	6.092E-01	PCI/SA	0.939	1.0E+0	2.448E-1
TH-228	9N\$1	0	1/17/2007 10:06:4	5 PM <b>-4.4948E-02</b>	6.357E-02	6.369E-02	4.174E-01	PCVSA	0.869	1.0E+0	8.203E-2
TH-230	9NS1	0	1/17/2007 10:06:4	5 PM <b>3.472E-01</b>	1.247E-01	1.283E-01	2.603E-01	PCI/SA	0.869	1.0E+0	8.203E-2
TH-232	9N\$1	0	1/17/2007 10:06:4	5 PM0.0E+00	0.0E+00	4.852E-02	2.603E-01	PCI/SA	0.869	1.0E+0	8.203E-2
33444	9JMLV8	10	J7A1001184	P-0824	FILTE	R 1/8/20	07 10:00:00	12/13	3/2006 1:18:00 PM		
ALPHA	BAS7	0	1/24/2007 2:12:29	PM 3.332E-02	7.576E-01	7.576E-01	3.963E+00	PCI/SA	1.0	1.0E+0	2.066E-2
RA-226	BXTE	0	1/24/2007 4:04:00	PM 2.912E-01	1.92E-01	1.944E-01	6.561E-01	PCI/SA	0.901	.1.0E+0	2.478E-1
TH-228	9NS1	0	1/17/2007 10:06:4	5 PM0.0E+00	0.0E+00	8.769E-02	4.705E-01	PCI/SA	0.55	1.0E+0	8.28E-2
TH-230	9NS1	0	1/17/2007 10:06:4	5 PM1.136E-01	1.136E-01	1.141E-01	4.542E-01	PÇI/SA	0.55	1.0E+0	8.28E-2
TH-232	9NS1	0	1/17/2007 10:06:4	5 PM1.136E-01	1.136E-01	1.141E-01	4.542E-01	PCI/SA	0.55	1.0E+0	8.28E-2
33444	9JMLV9	10	J7A1001185	P-0582	FILTE	R 1/8/20	07 10:00:00	12/13	3/2006 1:21:00 PM		
ALPHA	BAS7	0	1/24/2007 2:12:29	PM 4.1991E+00	1.476E+00	1.555E+00	4.504E+00	PCI/SA	1.0	1.0E+0	2.041E-2
RA-226	BXTE	0	1/24/2007 4:09:00	PM 1.5627E-01	1.511E-01	1.52E-01	5.415E-01	PCI/SA	0.992	1.0E+0	2.446E-1
TH-228	9NS1	0	1/17/2007 10:06:4	5 PM8.0735E-02	6.055E-02	6.094E-02	2.421E-01	PCI/SA	0.905	1.0E+0	8.161E-2
TH-230	9NS1	0	1/17/2007 10:06:4	5 PM3.5078E-01	1.185E-01	1.223E-01	2.338E-01	PCI/SA	0.905	1.0E+0	8.161E-2
TH-232	9NS1	0	1/17/2007 10:06:4	5 PM0.0E+00	0.0E+00	4.358E-02	2.338E-01	PCI/SA	0.905	1.0E+0	8.161E-2
33443	9JMLVA	10	J7A1001155	000581	FILTE	R 1/8/20	07 10:00:00	12/1	1/2006 12:20:00 PM		
ALPHA	BAS7	0	1/24/2007 11:27:1	6 <b>2.6821E+01</b>	3.115E+00	4.452E+00	4.498E+00	PCI/SA	1.0	1.0E+0	2.05E-2
RA-226	BXTE	0	1/24/2007 2:46:00	PM 3.0858E-02	1.647E-01	1.648E-01	6.393E-01	PCI/SA	1.115	1.0E+0	2.447E-1
TH-228	9NS1	0	1/17/2007 10:06:4	5 PM2.3414E-01	1.352E-01	1.369E-01	4.373E-01	PCI/SA	0.864	1.0E+0	8.202E-2
TH-230	9NS1	0	1/17/2007 10:06:4	5 PM2.5068E-01	1.149E-01	1.171E-01	3.007E-01	PCI/SA	0.864	1.0E+0	8.202E-2
TH-232	9NS1	0	1/17/2007 10:06:4	5 PM1.5041E-01	9.038E-02	9.143E-02	3.007E-01	PCI/SA	0.864	1.0E+0	8.202E-2
33444	9JMLVV	/10	J7A1001181	P-0820	FILTE	R 1/8/20	07 10:00:00	12/13	3/2006 12:10:00 PM		
ALPHA	BAS7	0	1/24/2007 2:12:29	PM 4.4092E+00	1.473E+00	1.564E+00	4.308E+00	PCI/SA	1.0	1.0E+0	2.084E-2
RA-226	BXTE	0	1/24/2007 2:49:00	PM 2.1515E-01	1.582E-01	1.597E-01	5.494E-01	PCI/SA	1.064	1.0E+0	2.489E-1
TH-228	9NS1	0	1/17/2007 10:06:4				3.378E-01		0.801	1.0E+0	8.348E-2
TH-230	9NS1	0	1/17/2007 10:06:4				3.262E-01		0.801	1.0E+0	8.348E-2
TH-232	9NS1	0	1/17/2007 10:06:4		6.079E-02		3.262E-01		0.801	1.0E+0	8.348E-2
33442	JMN851		J7A110000225				07 10:00:00		2006 12:25:00 PM		
RA-226	BXTE	0 B					8.118E-04		0.928	1.0E+0	1.522E+2
33442	JMN851		J7A110000225				07 10:00:00		2006 12:25:00 PM	I.ULTU	, week-
RA-226	BXTE	03 0 S					5.242E-04		9.188E-03 1.043	1.0E+0	1.501E+2
11/1-220	DATE	0 3	1/24/2007 4.20.00	TW 7.2/0E-03	J.JZ3L-04	3.37 JE-04	J.242L-04	FUUSA	8.100E-03 1.043	1.0510	1.50 12+2

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<sup>7011225, \*\*</sup>Samples Inserted | Updated | NotUpdated => 2 | 0 | 15,

\*\*Results Inserted | ReTestInserted | Updated | NotInserted => 17 | 0 | 0 | 0.

\*\*Diff RptDb | Qtims => .

#### **Summary Report**

Status Meth	Matrix	Wrk Ord	Paramete	Sa Act	Uncert	Q Units	Av ILcC	IDC	QC Yield	RYId
Ra-226 by	ASC-7	Ric	hland Stand	ard Ra-22	6/Ra-228 D	eem Wo Bli	k Subt.			
Calc TE	FILTER	JMK811AC	RA-226	-1.86E-02 <sup>~</sup>	(2.11E-01)	U4 PCI/SA	R 3.65E-01	8.04E-01	101%	
Calc TE	FILTER	JMLA11AC	RA-226	2.69E-01	(2.15E-01)	U4 PCI/SA	R 3.38E-01	7.45E-01	101%	
Calc TE	FILTER	JMLA41AC	RA-226	-2.01E-01	(1.49E-01)	U4 PCI/SA	R 2.87E-01	6.55E-01	106%	
Calc TE	FILTER	JMLA71AC	RA-226	4.22E-01	(1.78E-01)	PCI/SA	R 2.00E-01	5.03E-01	106%	
Calc TE	FILTER	JMLA81AC	RA-226	5.20E-01 🗸	(1.49E-01)	PCI/SA	R 1.18E-01	3.12E-01	91%	
Calc TE	FILTER	JMLT21AC	RA-226	1.78E-02 ✓	(1.72E-01)	U4 PCI/SA	R 2.93E-01	6.81E-01	97%	
Calc TE	FILTER	JMLT61AC	RA-226	1.98E-01 $\nu$	(1.12E-01)	PCI/SA	R 1.38E-01	3.54E-01	95%	
Calc TE	FILTER	JMLT71AC	RA-226	1.29E+00 <sup>C</sup>	/(3.34E-01)	PCI/SA	R 4.23E-01	9.18E-01	102%	
Calc TE	FILTER	JMLT81AC	RA-226	5.1 <b>9E-0</b> 1 🗸	(2.64E-01)	PCI/SA	R 3.89E-01	8.60E-01	84%	
Calc TE	FILTER	JMLVA1AC	RA-226	3.09E-02	(1.65E-01)	U4 PCI/SA	R 2.78E-01	6.39E-01	111%	
Calc TE	FILTER	JMLVW1AC	RA-226	2.15 <b>E-</b> 01 ~	(1.60E-01)	U4 PCI/SA	R 2.36E-01	5.49E-01	106%	
Calc TE	FILTER	JMLV31AC	RA-226	3.16E-01 <sup>2</sup>	(1.57E-01)	PCI/SA	R 1.93E-01	4.80E-01	101%	
Calc TE	FILTER	JMLV51AC	RA-226	9.36E-02 🗸	(1.64E-01)	U4 PCI/SA	R 2.67E-01	6.09E-01	94%	
Calc TE	FILTER	JMLV81AC	RA-226	2.91E-01 🗸	(1.94E-01)	U4 PCI/SA	R 2.82E-01	6.56E-01	90%	
Calc TE	FILTER	JMLV91AC	RA-226	1.56E-01 ビ	(1.52E-01)	U4 PCI/SA	R 2.35E-01	5.41E-01	99%	
Calc TE	FILTER	JMN851AA	RA-226	1.86E-04V	(2.21E-04)	U4 PCI/SA	R 3.43E-04	8.12E-04	B / 93%	
Calc TE	FILTER	JMN851AC		7.2 <b>8E-0</b> 3	(9.38E-04)		R 2.08E-04		/	79% V

Angela Jong 1/26/07 Pancinson

Batch Nbr: 7011225	11225			Alph	Alpha Beta,		26 by A	Ra-226 by ASC-7 , Calculated Results	culated	Resul	ts		1/25/2007 7:49:04 AM
							Detailed	Detailed Report					
Sq Status Method Matrix		Protocol	Protocol Equation Set	Wrk Ord	:	Units/Matrix QC/B	QC/BB Sa/On Date	AnalysisDate/PptWt	i	Sep1/Sep2 Date	QC/Tracer Vial MulvEntYld	ľ	Total/Analy Vol Final/Count Vol
1 Carc TE FILTER CID:P(0812LOT:J7A0902871 v4.8.26	FILTER 902871 v4.8.26	*STLE	Ra226WoBS	JMK811AC	C PCI/SA FILTER	_	12/05/06 12:25	01/24/07 14:00		01/19/07 15:05	RATA25303 1 RATA25303 Alq	1.00 SA 101% 0.235542 SA	1.00 SA 8542 SA
Sq Cnt Date	Parameter		Sample Cnt Bkgrnd Cnt Instr	1Cnt Instr	Сеош	Trc/Av	Ent Efficiency!	Efficiency 2 Ent	11 Yld Fet	Ent	Bik Value Ingr Fct	Conv Fct/Vc	Conv Fct/VolAdj Decay Abn
01/24/07 14:00	RA-226	£ 8	8 8		АЅФЭНА АЅС	z 	2.4113E+00 (4.316E-02)	1.0000E+00 N (0.000E+00)	101% 8%	z	1.7562E+00 (0.000E+00)	00 4.5045E-01 00) 4.245523	1.0001E+00
Sq Calc Date	Parameter	Avg ,	Sa Act	z o	Net Cnt Rt	Dpm Wo Blk	Blk Dpm-Blk	Blk Vol Used	<b>D</b>	Yield,EnFct	Chem YId, EFctU IDC/ILcC		BIKL.cC/MDC StdDvMdC/LcC
01/25/07	RA-226	۳	-0.018572 (0.21105)	<b>U4</b> -1.3	-1.33333E-02 (1.5151E-01)	-0.009711 (0.110352)	-0.009711 (0.110352)	11 1.00 52) (0.014142)	1.00 SA 1142)	101%	0.804465	465	
Sq Status Method Matrix		Protocol	Protocol Equation Set	Wrk Ord		Units/Matrix QC/B	QC/BB Sa/On Date	AnalysisDate/PptWt		Sep1/Sep2 Date	QC/Tracer Vial Mult/EntYld	ž.	Total/Analy Vol Final/Count Vol
2 Calc TE FILTER CID: P(813L) T. J. A0902872 v 4.8.26	FILTER 902872 v4.8.26	*STLE	Ra226WoBS JMLA11AC	JMLA11A	C PCVSA FILTER		12/05/06 12:10	01/24/07 13:53		01/19/07 15:05 01/24/07 10:53	RATA25304 1 RATA25304 Alq 1	1.00 SA 101% 0.249199 SA	1.00 SA 3199 SA
Sq Cnt Date	Parameter		Sample Cnt Bkgrnd Cnt	1 Cnt Instr	Geom	Trc/Av	Ent Efficiency1	Efficiency 2 Ent	nt Yld Fct	) <u>t</u>	Blk Value Ingr Fct	Conv Fct/Vc	Conv Fct/VolAdj Decay Abn
01/24/07 13:53	RA-226	50 /	4 8	ASG	Asdera Asc	z . >	2.5216E+00 (8.674E-02)	1.0000 <b>E</b> +00 N (0.000E+00)	101% 8%	z	1.7573E+00 (0.000E+00)		E+00
Sq Calc Date	Parameter	Avg	Sa Act	o	Net Crit Rt	Dpm Wo Blk	BIK Dpm-Bik	Bik Vol Used	2	Yield,EnFct	Yield, EnFct Chem YId, EFctU IDC/ILcC		BIKLCC/MDC StdDvMdC/LcC
01/25/07	RA-226	α	0.268754 (0.215195)	<b>U4</b> 2.15 (1.6	2.13333E-01 (1.6944E-01)	0.148673 (0.118794)	0.148673	73 1.00 94) (0.014142)	1.00 SA 4142)	101%	0.744704	704	5 5 5
Sq Status Method Matrix	Matrix	Protocol	Protocol Equation Set	Wrk Ord		Units/Matrix QC/B	QC/BB Sa/On Date	AnalysisDate/PptWt		Sep1/Sep2 Date	QC/Tracer Vial Mult/EntYld	1	Total/Analy Vol Final/Count Vol
3 Cale TE FILTER CID:P(0814L) T:J7A0902873 v4.8.26	FIL <b>TER</b> 902873 v4.8.26	•STLE	Ra226WoBS JMLA41AC	JMLA41A	C PCI/SA FILTER		12/05/06 12:45	01/24/07 14:00		01/19/07 15:05 01/24/07 11:00	RATA25305 1 RATA25305 Alq 1	1.00 SA 106% 0.24214 SA	1.00 SA 4214 SA
Sq Cnt Date	Parameter		Sample Cnt Bkgrnd Cnt	d Cnt Instr	Geom	Trc/Av	Ent Efficiency1	Efficiency 2 Ent	nt Yid Fct	Ent	Blk Value Ingr Fct	Conv Fct/Vc	Conv FctVolAdj Decay Abn
01/24/07 14:00	RA-226	50 50	8 8	ASC(	ASCGSA ASC	z >	2.1653E+00 (7.622E-02)	1.0000E+00 N (0.000E+00)	106% 8%	z	1.7562E+00 (0.000E+00)	00 4.5045E-01 00) 4.129844	1 1.0001E+00
Sq Calc Date	Parameter	Avg (	Sa Act	0	let Cnt Rt	Dpm Wo Bik	Bik Opm-Bik	-Bik Vol Used	72	Yield,EnFct	Yield,EnFct Chem Yld,EFctU IDC/ILcC		BIKLCC/MDC StdDvMdC/LcC
01/25/07	RA-226	α .	-0.201188 (0.148912)	U4 -1.3	-1.33333E-01 (9.7753E-02)	-0.108143 (0.079846)	3 -0.108143 (0.079846)	43 1.00 46) (0.014142)	1.00 SA 4142)	106%	0.654673	673 615	
Sq Status Method Matrix	Matrix	Protocol	Protocol Equation Set	Wrk Ord	:	Matrix QC/B	Units/Matrix QC/BB Sa/On Date	AnalysisDate/PptWt		Sep1/Sep2 Date	QC/Tracer Vial Mult/EntYld	Į	Total/Analy Vol Final/Count Vol
4 Calc TE FILTER CID: R-0815LDT: J7A0902874 v4.8.26	FILTER 902874 v4.8.26	: "	STLE Ra226WoBS	JMLA71AC	C PCI/SA FILTER		12/05/06 12:30	01/24/07 14:01		01/19/07 15:05 01/24/07 11:01	RATA25306 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1.00 SA 106% 0.240988 SA	1.00 SA 9988 SA
Sq Cnt Date	Parameter		Sample Cnt Bkgrnd Cnt	d Cnt Instr	Сеош	Trc/Av	Ent Efficiency!	Efficiency 2 Ent	nt YId Fct	Ent	Bik Value Ingr Fct	Conv Fct/Vc	Conv Fct/VolAdj Decay Abn
01/24/07 14:01	RA-226	16 /	9 9	ASC/	ASC ASC	z >	1.7118E+00 (9.244E-02)	1.0000E+00 N (0.000E+00)	106%	z	1.7560E+00 (0.000E+00)	00 4.5045E-01 00) 4.149583	1.0001E+00
- (1s Uncertainitis OC - Instrument Dete r-89 Counts are Den	es), Q - Qualification Level in Cardin the Card the Card	ier, U Resi Conc Units Combination	ult is Less Than s, MLcC - Metho	Lc = 1.645 • T xd Decision Le /90 and Y-90 (	PU wel in Conc ( Count. All Pic	Units, MDC-A	Page Minimum Detectable av Not be Significan	(1s Uncertainties), Q. Qualifier, U Result is Less Than Lc = 1.645 • TPU (1) - (1s Uncertainties), Q. Qualifier, U Result is Less Than Lc = 1.645 • TPU (1) - (1strument Detection Level in Conc Units, MLCC - Method Decision Level in Conc Units, MDC- Mirimum Detectable Concentration S-89 Courts are Derived from the Combination of Each S-489 and Y-90 Court. All Result Dioits May Not be Significants. Date/Time - mm/dd/wy himm, 24th Time	m/dd/vv/pp/m	n. 24hr Time	E	RecCnt:4	RADCALC v4.8.26 STL Richland
							•		11				

Batch Nbr: 7011225	7011225			Alpha Beta,	Beta,		Ra-226 by ASC-7		, Calculated Results	ılts	1/2	1/25/2007 7:49:05 AM
Sq Calc Date	e Parameter	Avg	Sa Act	O	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield,Enf	Yield,EnFct Chem YId,EFctU IDC/ILcC	TLC BIKLCC/MDC	MDC StdDvMdC/LcC
01/25/07	RA-226	Œ	0.421865 (0.178326)	2.200(	2.20000E-01 (8.9815E-02)	0.225683 (0.094675)	0.225683 (0.094675)	1.00 SA (0.014142)	)SA 106%	0.502699	1699 1502	
Sq Status Method Matrix		Protoco	Protocol Equation Set	Wrk Ord	Units/Ma	Units/Matrix QC/BB Sa/On Date	a/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial	MulvEntYld Tota/Analy Vol	ly Vol Final/Count Vol
S Carc TE	atc TE FILTER 00580[OT:J7A0902875 v4 8.26		*STLE Ra226WoBS JMLA81AC	JMLA81AC	PCI/SA FILTER		12/05/06 12:50	01/24/07 14:24	01/19/07 15:05	/AATA25307 1 RATA25307 AIQ	1.00 SA 91% 0.250659 SA	SA
Sq Cent Date	Parameter		Sample Cnt Bkgrnd Cnt	Cnt Instr	Geom	Trc/Av Ent E	Ent Efficiency1 E	Efficiency 2 Ent	YId Fet Ent	Bik Value Ingr Fct	Conv Fct/VolAdj	dj Decay Abn
01/24/07 14:24	.24 RA-226	2 2	48	ASCJMB ASC (18)	3 ASC	Z 2,	2.4836E+00 1.0 (1.095E-01) (0.00000000000000000000000000000000000	1.0000E+00 N (0.000E+00)	91% N 7%	1.7524E+00 (0.000E+00)		1.0001E+00
Sq Calc Date	e Parameter	Avg	Sa Act	) ja	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield, EnFct	et Chem Yld,EFctU IDC/ILcC	1LcC BIKLcC/MDC	MDC StdDvMdC/LcC
01/25/07	RA-226	αc	0.519991 (0.149043)	3.733;	3.73333E-01 (9.9555E-02)	0.28934 (0.081558)	0.28934 (0.081558)	1.00	1.00 SA 91% 142)	0.311986	1986 3318	
Sq Status Method Matrix		Protoco	Protocol Equation Set	Wrk Ord		Units/Matrix QC/BB Sa/On Date	a/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	OC/Tracer Vial Mult/EntYld	EntYid Total/Analy Vol	ly Vol Final/Count Vol
6 Calc TE FILTER CID:P-0816LOT.J7A1001151 v4.8.26	FILTER A1001151 v4.8.26	•	STLE Ra226WoBS	JMLT21AC	PCI/SA FILTER		12/11/06 11:40	01/24/07 14:16	01/19/07 15:05 01/24/07 11:16	RATA25308 1 RATA25308 Alq	1.00 SA 97% 0.238247 SA	SA SA
Sq Cnt Date	Parameter		Sample Cnt Bkgrnd Cnt	Cnt Instr	Сеод	Trc/Av Ent E	Ent Efficiency1 E	Efficiency 2 Ent	Yld Fct Ent	Bik Value Ingr Fct	Conv Fct/VolAdj Decay	d) Decay Abn
01/24/07 14:16	:16 RA-226	13 50	. 51	ASCKME ASC	E ASC	× ×	1.9262E+00 1.(2.562E-02) (0	1.0000E+00 N (0.000E+00)	N %8	1.7537E+00 (0.000E+00)	00 4.5045E-01 00) 4.197319	1.0000E+00
Sq Calc Date	e Parameter	Avg	Sa Act	Q Net	Net Cnt Rt	Dpm Wo Blk	Opm-Bik	Vol Used	Yield,EnFct	ct Chem Yld,EFctU IDC/ILcC	ILCC BIKLCC/MDC	MDC StdDvMdC/LcC
01/25/07	RA-226	Œ	0.017788	U4 1.000C	1.00000E-02 (9.6782E-02)	0.009408 (0.091052)	0.009408 (0.091052)	1.00 SA (0.014142)	S)	0.681277	1277	
Sq Status Method Matrix		Protoco	Protocol Equation Set	Wrk Ord	Units/M	Units/Matrix QC/BB Sa/On Date	a/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial Mult/EntYld	EntYld Total/Analy Vol	ly Vol Final/Count Vol
Calc TE ID:P-0817LOT:J7/	7 Calc TE FILTER CID:P-0817LOT:J7A1001152 v4.8.26	STLE	Ra226WoBS JMLT61AC	JMLT61AC	PCI/SA FILTER		12/11/06 12:00	01/24/07 14:21	01/19/07 15:30 01/24/07 11:21	RATA25309 1 RATA25309 Alq	1.00 SA 95% 0.234857 SA	SA SA
Sq Cnt Date	Parameter		Sample Cnt Bkgrnd Cnt	Cnt Instr	Geom	Trc/Av Ent E	Ent Efficiency1 E	Efficiency 2 Ent	Yld Fct Ent	Bik Value Ingr Fct	Conv Fct/VolAdj Decay	dj Decay Abn
01/24/07 14:21	21 RA-226	1 20	5 60	ASCPMA ASC	A ASC	Z 2,	2.4525E+00 1.0 (8.241E-02) (0	1.0000E+00 N (0.000E+00)	95% N 8%	1.7568E+00 (0.000E+00)	+00 4.5045E-01 +00) 4.257913	1.0000E+00
Sq Calc Date	e Parameter	Avg	Sa Act	Q Net	Net Cnt Rt	Dpm Wo Blk	Орт-ВІК	Vol Used	Yield,EnFct	ct Chem Yld,EFctU IDC/ILcC	ILC BIKLCC/MDC	MDC StdDvMdC/LcC
01/25/07	RA-226	Œ	0.198214 (0.112155)	1.366(7)	1.36667E-01 (7.6085E-02)	0.10334 (0.058226)	0.10334 (0.058226)	1.00 SA (0.014142)	SA 95%	0.353936	3936 7745	
Sq Status Method Matrix	:	Protoco	Protocol Equation Set	Wrk Ord	Units/M	Units/Matrix QC/BB Sa/On Date	a/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	OC/Tracer Vial Mult/Ent/Yld	EntYid Total/Analy Vol	ly Vol Final/Count Vol
8 Calc TE CID:P-0818LOT:J7A	8 Calc TE FILTER CID:P-0818LOT:J7A1001153 v4.8.26		STLE Ra226WoBS	JMLT71AC	PCI/SA FILTER		12/11/06 12:15	01/24/07 14:21	01/19/07 15:30	RATA25310 1 RATA25310 Alq	1.00 SA 102% 0.237006 SA	SA SA
Sq Cnt Date	Parameter		Sample Cnt Bkgrnd Cnt	Cnt Instr	Geom T	Geom Trc/Av Ent Efficiency1		Efficiency 2 Ent	Yld Fct Ent	Bik Value Ingr Fct	Conv Fct/VolAdj Decay	dj Decay Abn
. (1s Uncertair OC - Instrument D	nities), O - Qualifie etection Level in C	er, U Res Sonc Unit	tult is Less Than Loss. MLcC - Method	Decision Level	in Conc Un	iits, MDC-Minin	Page 2 num Detectable	() - (1s Uncertainties), Q - Qualifier, U Result is Less Than Lc = 1.645 * TPU IDC - Instrument Detection Level in Conc Units, MLCC - Method Decision Level in Conc Units, MDC- More than Detectable Concentration St.89 Counts are Derived from the Combination of Each St.89000 and V.90 Count, All Beauth Digits May Not be Similificante. Detection - mondation of Each St.89000 and V.90 Count, All Beauth Digits May Not be Similificante.		:	RecCnt:8	RADCALC v4.8.26 STL Richland
		S C C C C C C C C C C C C C C C C C C C	שו עו במטי טייטיי	Valid 1-ev	, All 196	יי לפייי פוועים ווווי	U 55 519 IIII 56 10	s, Dater Illine - tilline	yy (85,000), 4,400, 100	,	٠	

Batch Nbr: 7011225	1225		Alpha	Alpha Beta,		by ASC	Ra-226 by ASC-7 , Calculated Results	ated Resu	ılts	1/25/2007 7:49:05 AM;	5 AM;
Sq Calc Date	Parameter	Avg Sa Act	O	Net Cnt Rt	Dpm Wo Blk	Dpm-Blk	Voi Used	Yield,EnF	Yield, EnFct Chem Yld, EFctU IDCALcC	BIKL.cC/MDC StdDvMdC/LcC	3Lcc
01/25/07	RA-226	R 0.156273 (0.151995)	U4 1.1666 (1.127	1.16667E-01 (1.1279E-01) (	0.084845	0.084845	1.00 SA (0.014142)	%66 YS	(12:10) 0.541472 0.234575		
Sq Status Method Matrix		Protocol Equation Set	Wrk Ord	Units/Ma	Units/Matrix QC/BB Sa/On Date	a/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	QC/Tracer Vial Mul/EntYld	d Total/Analy Vol Final/Count Vol	nt Vol
16 Calc TE FLTER STLE RAZZ CID:INTRA-LAB BLANKIOT.J74110000225 v4.8.26	FILTER ANKIOT:J7A1100	**************************************	JMN851AA	PCI/SA FILTER	<b>B</b> 12/05	<b>B</b> 12/05/06 12:25	01/24/07 16:19	01/19/07 15:50	RATA25318 1 93%	1.00 SA 152.17 SA	
Sq Cnt Date	/ Parameter	Parameter Sample Cnt Bkgrnd Cnt Instr	Cnt Instr	Geom	Geom Trc/Av Ent Efficiency1		Efficiency 2 Ent	Yld Fct Fnt	Bik Value Ingr Fct (	Conv Fct/VolAdj Decay	Abn
01/24/07 16:19 /BA-226	/RA-226	14 / 12 / 50 / 60 /	ASCMRA ASC	A ASC	N 2.3 Y (1.0	N 2.3844E+00 1.0000E+00 (1.044E-01) (0.000E+00)	1.0000E+00 N (0.000E+00)	93% N 7%	1.7415E+00 4.5045E-01 (0.000E+00) 0.006572	4.5045E-01 1.0001E+00 0.006572	
Sq Calc Date	Parameter	Avg Sa A	) Š	Net Cnt Rt	Dpm Wo Bik	Dpm-Blk	Vol Used	Yield,EnF	Yield, EnFct Chem Yld, EFctU IDCALcC	BIKLcC/MDC SIdDvMdC/LcC	C/LcC
01/25/07	RA-226	R 0.000186 (0.000221)	U4 8.0000 (9.451	8.00000E-02 (	0.062989	0.062989	1.00	1.00 SA 93% 142)	0.000812		
Sq Status Method Matrix		Protocol Equation Set	Wrk Ord	Units/Ma	Units/Matrix QC/BB Sa/On Date	a/On Date	AnalysisDate/PptWt	Sep1/Sep2 Date	GC/Tracer Vial Mult/Ent/Vid	d Total/Analy Vol Final/Count Vol	nt Vo
17 Calc TE RILTER 'STLE Ra22 CID:INTRA-LAB CHECK OT:J7A110000225 v4.8.26	KILTER CALOT:J7A1100	*STLE Ra226WoBS JMN851AC 000225 v4.8.26	JMN851AC	PCI/SA FILTER	<b>s</b> 12/05	<b>S</b> 12/05/06 12:25	01/24/07 16:20	01/19/07 15:50 01/24/07 13:20 <b>٧</b>	RASC4320 1 104%	1.00 SA 150.10 SA	
Sq Cnt Date	/ Parameter	Parameter Sample Cnt Bkgrnd Cnt Instr	Cnt Instr	Geom	Geom Trc/Av Ent Efficiency1		Efficiency 2 Ent	Yld Fct Ent	Bik Value Ingr Fct	Conv Fct/VolAdj Decay	Abn
01/24/07 16:20	RA-226	187 6 6 60 60 60 60 60 60 60 60 60 60 60 60	ASCOMB ASC	B ASC	N 2.6 Y (1.0	2.6138E+00 1.0000E+00 (1.085E-01) (0.000E+00)	1.0000E+00 N (0.000E+00)	104% N 8%	1.7414E+00 4.5045E-(0.000E+00) 0.006662	4.5045E-01 1.0001E+00 0.006662	
Sq Calc Date	Parameter	Avg Sa Act	0	Ner Cut Rt	Dpm Wo Blk	Dpm-Blk	Vol Used	Yield, EnF	Yield, EnFct Chem Yld, EFctU IDCALCC	BIKECANDC StdDvMdC/LcC	S/cc
01/25/07	RA-226	R 0.007278 (0.000938)	3.640	3.64000E+00 (2.7653E-01)	2.42505 (0.285842)	2.42505 (0.285842)	1.00	.00 SA 104%	79% 0.000524		
				_							

(1s Uncertainities), Q - Qualifier, U Result is Less Than Lo = 1645 \* TPU

OC - Instrument Detection Level in Conc Units, MLcC - Method Decision Level in Conc Units, MDC- Minimum Detectable Concentration

Sr-89 Counts are Derived from the Combination of Each Sr-89/90 and Y-90 Count, All Result Digits May Not be Significants, Date/Time - mm/dd/yy rh:mm, 24hr Time Page 5

RADCALC v4.8.26 STL Richland

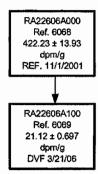
RecCnt:17

## RADIUM 226

## STANDARDS AND TRACEABILITY

STL RICHLAND 890

### RA22606A



STL RICHLAND

### RA22606.XLW

## ISOTOPE DILUTION RECORD

1) Prepared by tda	_	2) Date Prepared			10/14/2005
3) Source Identification	Number / Ref. Number	RA22606A000			6068
4) Source Activity (dpm ± dpm/s	<b>3</b> )	4.2223E+02	_	±	1.393E+01
5) Percent error of Source Activ	rity	3.3	_%		
6) Weight of Source Material us	ed (g)	50	_		
7) (% Error) of Weight of Source	e Material used	0.0096	_%		
8) Diluent		1 M HNO3	_		
9) Total Weight of the Dilution (	g)	арргох. 750 g			
10) (% Error) of Total Weight of	the Dilution	0.0400	_%		
11) Specific Activity of E	iluted Solution dpm/g	2.1120E+01	_	±	6.970E-01
12) Total Uncertainty		3.300	_%		
13) Dilution Identificatio	n Number / Ref. Number	RA22606A100			6069
14) Calibration Reference Date		11/1/2001	_		
15) Isotope Inventory File upda	te by/date	tda			3/21/2006
16) Reviewed by/date			_		
17) Location QCLAE	<u>.                                    </u>	18) Exhausted			
*************	************	******	*****	*****	
	CALCULATIONS				
7) % Error of Wt. used = (0.004	8 / Weight of Source Material used * 10	00)			
10) % error of Dilution Wt. = (0.	3 / Total Weight of Dilution * 100)				
11) Specific Activity = Source A	ctivity * Wt. of Source Material used / T	Total Wt. of the Dilutio	n		
12) % Total Uncertainty =	(% error of Source Activity ^2 + % e	error of Wt. Used^2 +	% er	ror of D	ilution Wt.^2)

Form: CC-006, 7/15/99, Rev 3

STL RICHLAND 892

# ISOTOPE RECORD FORM

1) Isotope	Ra-226	2) Referer	nce Number	6068
3) Half Life _	1600 yrs.	4) Storage	Location	qclab
5) Source Ide	ntification Number_		Ra22606	3A000
*******	**************************************	LIBRATION	**************************************	******
6) Activity as R	eceived Units		195.9 pC	Ci/mL
7) Overall Unce	ertainty Percent		3.30	%
8) Reference D	ate / Time		11/1/2	001
9) Activity dpr	m/g		422.23 0	lpm/g
10) Volume or N	Mass (ml/g)		100 r	nL
11) Calibrated b	py	<del></del>	<u>IPL</u>	
12) Certificate S	Solution Number		763-6	3-7
******	********	**************************************	**************************************	*****
13) Date Receiv	/ed		3/21/2006	from Denver Lab
14) Surveyed by	y			tda
15) Survey Reading (Beta/Gamma) cpm		<300 cpm		
16) Survey Reading (Alpha) cpm			0	
*******	*******	******	*****	*****
17) Activity Con	version1	95.9 pCi/mL	. x 2.22 dpm/pCi	/ 1.025 g/mL =
		422.23 dpi	m/g	
18) Remarks _		From STL E	Denver #RA22601	1AL
	<u> </u>		THE STATE OF THE S	
19) Isotope File	Updated by	-	tda 3/21/2006	3
20) QC Approve	ed		J.C. 8/	77/06



24937 Avenue Tibbitts Valencia, California 91355 STL# RASSECTAL REC'D 10/25/01

An Eckert & Ziegler Company

Tel 661·309·1010 Fax 661-257-8303

# CERTIFICATE OF CALIBRATION ALPHA STANDARD SOLUTION

Radionuclide:

Ra-226

Customer:

SEVERN TRENT LABORATORIES, INC.

Half-life:

1600 ± 7 years

P.O. No.:

1-Nov-01 12:00 PST

μCi

Catalog No.: Source No.:

7226 763-63-7 Reference Date: Contained Radioactivity:

0.09795

1173413

3.624

kBq

Physical Description:

A. Mass of solution:

1.15278 g in 1 mL V-Vial

B. Chemical form:

Ra(NO<sub>3</sub>)<sub>2</sub> in 1M HNO<sub>3</sub>

C. Carrier content:

10 µg Ba/mL of solution

D. Density:

1.0318 g/mL @ 20°C.

. Radioimpurities:

None detected (Daughters not in equilibrium as of 22 Oct 01)

Radionuclide Concentration:

0.08497 µCi/g,

3.144

kBq/g

Method of Calibration:

This source was prepared from a weighed aliquot of solution whose activity in µCi/g was determined using gamma ray spectrometry.

Peak energy used for integration:

186.0 keV

Branching ratio used:

0.0351 gammas per decay

Uncertainty of Measurement:

A. Type A (random) uncertainty:

1.3 %

B. Type B (systematic) uncertainty:

3.0 %

C. Uncertainty in aliquot weighing:

± 0.4 %

D. Total uncertainty at the 99% confidence level:

3.3 %

#### Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from NCRP Report No. 58, 1985.
- This solution has a working life of 5 years.

an	U	Kha-	
	Juali	tv Control	

22-0ct-01

IPL Ref. No.:

763-63

ISO SOUL CERTIFIED .

Industrial Gauging Laboratory 1800 North Keystone Street Burbank, California 91504

# RADIUM 226 CONTINUING CALIBRATION

STL RICHLAND

Generated 6-FEB-2007 16:08:01.95

QA Filename : \$DISK1:[SCINT3.QA]CHK.QAF;1

-- Multi-Test Full Report --

Description

: 10 min check, ascint-3

Parameter Units : counts

Parameter Type : Manual

---- Lower/Upper Bounds Test Parameters ----

Lower Bound

Sample Analyst

: 249674.000000 Upper Bound : 270464.000000

Investigate Level: 2.000000

Action Level : 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Sample ID

Start Date

Measurement Time

24-JAN-2007 09:23 count

26-JAN-2007 08:37 count

29-JAN-2007 08:47 count

30-JAN-2007 09:05 count

: 1-JAN-2006 00:00 End Date

: 1-JUL-2006 00:00

Value LU|SD|UD|BS Rej

Mean

: 260069.015625

Std Deviation: 3465.084961

258629.0000

259814.0000

261189.0000

263326.0000

2-JAN-2007 08:40 count	260187.0000
3-JAN-2007 09:57 count	266196.0000
4-JAN-2007 08:46 count	263415.0000
5-JAN-2007 08:33 count	264762.0000
8-JAN-2007 08:35 count	262790.0000
9-JAN-2007 08:33 count	260047.0000
10-JAN-2007 09:31 count	264474.0000
11-JAN-2007 09:11 count	265175.0000
11-JAN-2007 16:54 count	2.0000 Be Ac
12-JAN-2007 08:45 count	260393.0000
13-JAN-2007 07:47 count	265048.0000
15-JAN-2007 08:46 count	258736.0000
17-JAN-2007 09:02 count	258675.0000
18-JAN-2007 08:46 count	260230.0000
19-JAN-2007 08:55 count	264580.0000
22-JAN-2007 09:17 count	258394.0000
23-JAN-2007 08:41 count	/ 261374.0000

file:///P|/Transfer/qa1\_asc3\_6-feb-2007-16080257.txt

31-JAN-2007 09:52 count

261200.0000

1-FEB-2007 08:48 count

260783.0000

Quality Assurance Report.

Generated 6-FEB-2007 16:08:02.36

QA Filename : \$DISK1:[SCINT3.QA]BKG,QAF;1

-- Multi-Test Full Report --

Description

: 1000 min bkg, ascint-3

Parameter Units : counts

Parameter Type: Manual

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 0.000000

Upper Bound : 5.000000

Investigate Level: 2.000000

Action Level : 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date

: 1-JUN-2005 00:00 End Date

: 1-JAN-2006 00:00

Mean

: 0.000000

Std Deviation: 0.000000

Measurement Time Sample ID Sample Analyst

Value LU|SD|UD|BS Rej

26-JAN-2007 16:14 count /

0.0000

Quality Assurance Report. Generated 6-FEB-2007 16:08:22.27

QA Filename : \$DISK1:[SCINT6.QA]CHK.QAF;1

-- Multi-Test Full Report --

Description : 10 min check/ascint-6

Parameter Units: counts Parameter Type: Generic

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 23774.000000 Upper Bound : 24618.000000

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-AUG-2006 00:00 End Date : 1-NOV-2006 00:00

Mean : 24302.363281 Std Deviation : 210.522400

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

24274.0000

24091.0000

2-JAN-2007 08:40 count 24506.0000 3-JAN-2007 09:57 count 24229.0000 4-JAN-2007 08:46 count 23679.0000 Be|In| | 4-JAN-2007 09:02 count 24076.0000 5-JAN-2007 08:33 count 24207.0000 8-JAN-2007 08:35 count 24635.0000 Ab 8-JAN-2007 08:52 count 24424.0000 9-JAN-2007 08:33 count 24185.0000 10-JAN-2007 09:31 count 24744.0000 Ab|In| 10-JAN-2007 09:44 count 24491.0000 11-JAN-2007 09:12 count 24541.0000 11-JAN-2007 16:54 count 3.0000 Be|Ac| 12-JAN-2007 08:45 count 24445.0000 13-JAN-2007 07:41 count 24501.0000 15-JAN-2007 08:46 count 24268.0000 17-JAN-2007 09:02 count 24282.0000 18-JAN-2007 08:46 count 24390.0000 19-JAN-2007 08:55 count 24325.0000 22-JAN-2007 09:17 count 24134.0000

23-JAN-2007 08:41 count

24-JAN-2007 09:23 count \( \nu \)

25-JAN-2007 08:22	count	24310.0000	
26-JAN-2007 08:37	count	24515.0000	$  \cdot  $
29-JAN-2007 08:47	count	24274.0000	$  \cdot  $
30-JAN-2007 09:05	count	24336.0000	
31-JAN-2007 10:10	count	24323.0000	
1-FEB-2007 08:48 c	count	24140.0000	

Generated 6-FEB-2007 16:08:22.62

QA Filename : \$DISK1:[SCINT6.QA]BKG,QAF;1

-- Multi-Test Full Report --

Description : 1000 min bkg, ascint-6

Parameter Units : counts Parameter Type : Manual

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 0.000000 Upper Bound : 5.000000

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUN-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 2.000000 Std Deviation : 1.603567

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

26-JAN-2007 16:14 count 0.0000 | | |

Generated 5-MAR-2007 16:04:59.14

QA Filename

: \$DISK1:[SQÍNT10.QA]CHK.QAF;1

-- Multi-Test Full Report --

Description

: 10 min check, ascint-10

Parameter Units: counts

Parameter Type: Manual

---- Lower/Upper Bounds Test Parameters ----

Lower Bound

: 11253.000000

Upper Bound : 12063.000000

Investigate Level: 2.000000 Action Level : 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date

: 1-AUG-2006 00:00 End Date

: 1-NOV-2006 00:00

· 11677 519531

Std Deviation · 141 200577

Mean : 116	77.519531	Std Deviation: 141.20	05//	
Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
2-JAN-2007 07:51	count	11589.0000		
3-JAN-2007 08:19	count	11774.0000	1 1	
4-JAN-2007 08:10	count	11571.0000	iii	
5-JAN-2007 07:48	count	11726.0000	İİİ	
8-JAN-2007 07:49	count	11626.0000		
9-JAN-2007 07:51	count	11638.0000		
10-JAN-2007 07:57	count	11732.0000		
11-JAN-2007 08:31	count	11945.0000		
11-JAN-2007 16:54	count	1.0000 B	e Ac	
12-JAN-2007 08:05	count	11768.0000		
13-JAN-2007 07:28	count	11867.0000		
15-JAN-2007 08:06	count	11657.0000		•
17-JAN-2007 08:15	count	11600.0000	-111	
18-JAN-2007 08:03	count	11674.0000		
19-JAN-2007 08:12	count	11659.0000		
22-JAN-2007 08:35	count	11374.0000	In	
23-JAN-2007 07:55	count /	11703.0000		
24-JAN-2007 07:52	count $\sqrt{}$	11906.0000	111	
26-JAN-2007 07:53	count	11647.0000	111	
29-JAN-2007 08:05	count	11764.0000		
30-JAN-2007 08:25	count	11947.0000	111	

31-JAN-2007 09:15 count	11782.0000
1-FEB-2007 08:02 count	11712.0000
5-FEB-2007 08:06 count	11648.0000
7-FEB-2007 08:22 count	11540.0000
8-FEB-2007 07:51 count	11789.0000
9-FEB-2007 07:49 count	11675.0000
12-FEB-2007 07:39 count	11741.0000
13-FEB-2007 07:55 count	11766.0000
14-FEB-2007 07:46 count	11803.0000

Generated 5-MAR-2007 16:04:59.52

QA Filename

: \$DISK1:[SCINT10.QA]BKG.QAF;1

-- Multi-Test Full Report --

Description : 1000 min bkg, ascint-10

Parameter Units: counts Parameter Type: Manual

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 0.000000 Upper Bound : 5.000000

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUN-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 1.142857 Std Deviation : 0.899735

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

26-JAN-2007 16:15 count 2.0000 | | |

Quality Assurance Report. Generated 5-MAR-2007 16:05:07.40

QA Filename : \$DISK1:[SCINT16.QA]CHK.QAF;1

-- Multi-Test Full Report --

Description : 10 min check, ascint-16

Parameter Units: counts Parameter Type: Manual

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 22908.199219 Upper Bound : 23435.000000

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-AUG-2006 00:00 End Date : 1-JAN-2007 00:00

Mean : 23187.943359 Std Deviation : 180.876251

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

2-JAN-2007 07:51 count 23060.0000 3-JAN-2007 08:19 count 23331.0000 4-JAN-2007 08:10 count 23149.0000 5-JAN-2007 07:48 count 23481.0000 Abl 5-JAN-2007 08:10 count 23160.0000 8-JAN-2007 07:49 count 23487.0000 Ab | | 8-JAN-2007 08:16 count 23510.0000 Ab 9-JAN-2007 07:51 count 23284.0000 10-JAN-2007 07:57 count 23233.0000 11-JAN-2007 08:31 count 23084.0000 11-JAN-2007 16:55 count 2.0000 Be|Ac| 12-JAN-2007 08:05 count 23350.0000 13-JAN-2007 07:28 count 23198.0000 15-JAN-2007 08:06 count 22999.0000 17-JAN-2007 08:15 count 23390.0000 18-JAN-2007 08:03 count 23135.0000 19-JAN-2007 08:12 count 23378.0000 22-JAN-2007 08:36 count 23311.0000 23-JAN-2007 07:55 count 23310.0000 24-JAN-2007 07:52 count 23208.0000 26-JAN-2007 07:54 count 23335.0000

```
file:///P//Transfer/qa1 asc16 5-mar-2007-16050798.txt
29-JAN-2007 08:05 count
                                        23153.0000
30-JAN-2007 08:25 count
                                        23243.0000
31-JAN-2007 09:35 count
                                        23070.0000
1-FEB-2007 08:03 count
                                        23638.0000 Ab|In| |
1-FEB-2007 08:25 count
                                        23372.0000
5-FEB-2007 08:06 count
                                        23155.0000
8-FEB-2007 07:51 count
                                        23593.0000 Ab|In| |
8-FEB-2007 08:16 count
                                        23775.0000 Ab|Ac| |
9-FEB-2007 07:49 count
                                        23591.0000 Ab|In| |
9-FEB-2007 08:07 count
                                        23297.0000
12-FEB-2007 07:39 count
                                        23561.0000 Ab|In| |
12-FEB-2007 08:00 count
                                        23215.0000
13-FEB-2007 07:55 count
                                        23368.0000
14-FEB-2007 07:46 count
                                        23163.0000
                               Generated 5-MAR-2007 16:05:07.80
Quality Assurance Report.
               : $DISK1:[SCINT16.QA]BKG.QAF;1
QA Filename
-- Multi-Test Full Report --
Description
              : 1000 min bkg, ascint-16
Parameter Units: counts
                              Parameter Type: Manual
  ---- Lower/Upper Bounds Test Parameters ----
                               Upper Bound : 5.000000
Lower Bound
                : 0.000000
Investigate Level: 2.000000
                               Action Level : 3.000000
   ---- Sample Driven N-Sigma Test Parameters ----
             : 1-JUN-2005 00:00 End Date
Start Date
                                           : 1-JAN-2006 00:00
             : 2.250000
                            Std Deviation: 1.035098
Mean
Measurement Time
                  Sample ID
                                                   Value LU|SD|UD|BS Rej
                                Sample Analyst
```

5.0000

|In|

26-JAN-2007 16:15 count

Quality Assurance Report. Generated 5-MAR-2007 16:05:15.37

QA Filename : \$DISK1:[SCINT18.QA]CHK.QAF;1

-- Multi-Test Full Report --

Description : 10 min check, ascint-18

Parameter Units: counts Parameter Type: Manual

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 19816.000000 Upper Bound : 21118.000000

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-AUG-2006 00:00 End Date : 1-NOV-2006 00:00

Mean : 20453.871094 Std Deviation : 182.771866

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

2-JAN-2007 08:40 count 20305.0000 3-JAN-2007 09:58 count 20425.0000 4-JAN-2007 08:47 count 20528.0000 20513.0000 5-JAN-2007 09:05 count 8-JAN-2007 08:55 count 20234.0000 9-JAN-2007 08:33 count 20438.0000 10-JAN-2007 09:31 count 20447.0000 11-JAN-2007 09:12 count 20663.0000 12-JAN-2007 08:46 count 20846.0000 |In| 17-JAN-2007 09:03 count 20310.0000 18-JAN-2007 08:46 count 20557.0000 19-JAN-2007 08:55 count 20070.0000 In 23-JAN-2007 08:41 count 20370.0000 24-JAN-2007 09:23 count 20593.0000 26-JAN-2007 08:37 count 20653.0000 29-JAN-2007 08:47 count 20619.0000 30-JAN-2007 09:05 count 20685.0000 31-JAN-2007 10:10 count 20374.0000 1-FEB-2007 09:08 count 20378.0000 5-FEB-2007 09:04 count 20309.0000 8-FEB-2007 09:09 count 21624.0000 Ab|Ac| |

8-FEB-2007 09:23 co	ount	22072.0000	Ab Ac
9-FEB-2007 08:58 co	ount	21441.0000	Ab Ac
12-FEB-2007 08:43 c	ount	22149.0000	Ab Ac
12-FEB-2007 08:57 c	ount	21805.0000	Ab Ac
13-FEB-2007 08:30 c	ount	21764.0000	Ab Ac
13-FEB-2007 08:53 c	ount	21558.0000	Ab Ac
14-FEB-2007 08:33 c	ount	20268.0000	

Generated 5-MAR-2007 16:05:15.75

QA Filename

: \$DISK1:[SCINT18.QA]BKG.QAF;1

-- Multi-Test Full Report --

Description

: 1000 min bkg, ascint-18

Parameter Units: counts

Parameter Type: Manual

---- Lower/Upper Bounds Test Parameters ----

Lower Bound

: 0.000000

Upper Bound : 5.000000

Investigate Level: 2.000000

Action Level : 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date

: 1-JUN-2005 00:00 End Date

: 1-JAN-2006 00:00

Mean

: 0.428571

Std Deviation: 0.786796

Measurement Time

Sample ID

Sample Analyst

Value LU|SD|UD|BS Rej

26-JAN-2007 16:15 count

0.0000 | | |

Quality Assurance Report. Generated 5-MAR-2007 16:05:23.27

QA Filename : \$DISK1:[SCINT21.QA]CHK.QAF;1

-- Multi-Test Full Report --

Description : 10 min check, ascint-21

Parameter Units : counts Parameter Type : Manual

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 75978.000000 Upper Bound : 79693.000000

Measurement Time	Sample ID	Sample Analyst	Value	LU SD UD BS Rej
2-JAN-2007 08:40	count	77544.0000		
3-JAN-2007 09:58	count	78072.0000	111	. : '
4-JAN-2007 08:47	count	78101.0000		
5-JAN-2007 08:34	count	77936.0000		
8-JAN-2007 08:35	count	78834.0000	111	
9-JAN-2007 08:33	count	78123.0000	111	
10-JAN-2007 09:31	count	78787.0000	-	•
11-JAN-2007 09:12	count	78427.0000		
12-JAN-2007 08:46	count	78537.0000		
13-JAN-2007 07:45	count	78727.0000		
15-JAN-2007 08:46	count	78016.0000		
17-JAN-2007 09:03	count	78336.0000		
18-JAN-2007 08:46	count	77737.0000		
19-JAN-2007 08:55	count	77705.0000		
22-JAN-2007 09:17	count	77935.0000		
23-JAN-2007 08:41	count /	78344.0000		
24-JAN-2007 09:23	count $\checkmark$	78268.0000		
26-JAN-2007 08:37	count	78223.0000		
29-JAN-2007 08:47	count	78141.0000		
30-JAN-2007 09:05	count	77609.0000		
31-JAN-2007 09:53	count	77831.0000		
1-FEB-2007 08:49	count	77882.0000		
5-FEB-2007 09:04	count	78110.0000		
8-FEB-2007 08:38	count	78423.0000	+	
9-FEB-2007 08:26	count	77999.0000		
12-FEB-2007 08:23	count	78282.0000		
13-FEB-2007 08:30	count	77907.0000		

14-FEB-2007 08:33 count

77974.0000

Quality Assurance Report.

Generated 5-MAR-2007 16:05:23.58

QA Filename : \$DISK1:[SCINT21.QA]BKG.QAF;1

-- Multi-Test Full Report --

Description : 1000 min bkg, ascint-21

Parameter Units: counts Parameter Type: Manual

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 0.000000 Upper Bound : 5.000000

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUN-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 0.000000 Std Deviation : 0.000000

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

26-JAN-2007 16:15 count 0.0000 | | |

Quality Assurance Report. Generated 5-MAR-2007 16:05:29.40

QA Filename : \$DISK1:[SCINT24.QA]CHK.QAF;1

-- Multi-Test Full Report --

Description : 10 min check, ascint-24

Parameter Units : counts Parameter Type : Generic

---- Lower/Upper Bounds Test Parameters ----

Lower Bound : 44810.000000 Upper Bound : 47071.000000

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JAN-2006 00:00 End Date : 1-JUL-2006 00:00

Mean : 45940.640625 Std Deviation : 376.874664

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

2-JAN-2007 07:51 count 45851.0000 3-JAN-2007 08:19 count 45776.0000 4-JAN-2007 08:10 count 45604.0000 5-JAN-2007 07:48 count 45879.0000 8-JAN-2007 07:50 count 46852.0000 9-JAN-2007 07:52 count 46459.0000 10-JAN-2007 07:57 count 46580.0000 11-JAN-2007 08:31 count 46466.0000 12-JAN-2007 08:05 count 45877.0000 13-JAN-2007 07:45 count 46074.0000 15-JAN-2007 08:06 count 45870.0000 17-JAN-2007 08:15 count 45733.0000 18-JAN-2007 08:03 count 45705.0000 19-JAN-2007 08:12 count 45915.0000 22-JAN-2007 08:36 count 45400.0000 23-JAN-2007 07:56 count 45846.0000 24-JAN-2007 07:53 count \ 46036.0000 25-JAN-2007 08:22 count 46207.0000 26-JAN-2007 07:54 count 46023.0000 29-JAN-2007 08:06 count 46139.0000 30-JAN-2007 08:25 count 45506.0000

31-JAN-2007 09:15 co	ount	45847.0000	
1-FEB-2007 08:03 cor	unt	45988.0000	
5-FEB-2007 08:06 cor	unt	45869.0000	
7-FEB-2007 08:22 cor	unt	46918.0000	In
8-FEB-2007 07:51 cor	unt	46231.0000	
9-FEB-2007 07:49 cor	unt	46402.0000	
12-FEB-2007 07:39 co	ount	46157.0000	
13-FEB-2007 07:55 co	ount	45968.0000	
14-FEB-2007 07:47 co	ount	46400.0000	

Generated 5-MAR-2007 16:05:29.77

QA Filename : \$DISK1:[SCINT24.QA]BKG.QAF;1

-- Multi-Test Full Report --

Description : 1000 min bkg, ascint-24

Parameter Units: counts Parameter Type: Manual

---- Lower/Upper Bounds Test Parameters ----

Investigate Level: 2.000000 Action Level: 3.000000

---- Sample Driven N-Sigma Test Parameters ----

Start Date : 1-JUN-2005 00:00 End Date : 1-JAN-2006 00:00

Mean : 0.142857 Std Deviation : 0.377964

Measurement Time Sample ID Sample Analyst Value LU|SD|UD|BS Rej

26-JAN-2007 16:15 count 0.0000 | | |